Primary Productivity of Ice Algae on the Labrador Shelf from March 16 to March 27, 1984

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Les numéros 1 à 25 de cette série ont été publiés à titre de Records statistiques, Service des pêches et de la mer. Les numéros 26-160 ont été publiés à titre de Rapports statistiques du Service des pêches et de la mer, Ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 161.

Le titre exact paraît au haut du résumé de chaque rapport.

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Fisheries and Aquatic Sciences No. 559

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Abstract

Irwin, B., Caverhill, C., Dickie, P., Hodgson, M., and Platt, T. 1986. Primary productivity of ice algae on the Labrador Shelf from March 16 to March 27, 1984. Can. Data Rep. Fish. Aquat. Sci. No. 559: iv + 143 p.

During the period 16 March to 27 March 1984 samples of ice algae were collected from CSS Baffin on the Labrador shelf for experiments on their rates of primary production. In this report we make available the raw data and the fitted light saturation parameters.

Résumé

Irwin, B., Caverhill, C., Dickie, P., Hodgson, M., and Platt, T. 1986. Primary productivity of ice algae on the Labrador Shelf from March 16 to March 27, 1984. Can. Data Rep. Fish. Aquat. Sci. No. 559: iv + 143 p.

Pendant la pèriode du 16 mars au 27 mars 1984 des échantillons d'algues de glace on êté ranassé du MSC Baffin sur le plateau du Labrador. Des expériences ont été effectuées pour mesurer leur taux de production primaire. Dans ce rapport nous présentons les données brutes ainsi que les paramètres calculés pour représenter les courbes de production en fonction de la lumière.

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Introduction

This is the tenth in a series of data reports giving the results of experiments on photosynthetic production versus light for natural phytoplankton populations in the North Atlantic and adjacent waters north of 50°N. Samples were collected from CSS Baffin from 16 to 27 March 1984 on the Labrador shelf 100 nautical miles NE of Newfoundland. At this time of year this area is almost completely covered with the seasonal ice pack. This was a joint cruise with Marine Mammals Division of the North West Atlantic Fisheries Institute, St. Johns, Newfoundland.

Sampling

During the first three days of the cruise water samples were collected with 30 ℓ Niskin bottles in loose (< 8:10) pack ice. The first attempts to collect ice algae were undertaken from a 20m launch. Freshly broken and turned over ice were sampled by chipping discoloured ice into a plastic bucket. This procedure proved to be time consuming and dangerous because of the constant motion of the ice and its tendency to close quickly any open leads. It was observed that when the ship was breaking ice, a discoloured (brown) slurry would appear along the edges of the broken ice pans. This slurry was collected with a glass beaker directly from the edge of the ice pan. Pieces of brown coloured granulated ice were collected in the same manner. It was observed that the discoloured ice was always granulated and easily shattered. This granulated ice was confined to the bottom 10 cm of the ice. Ice in the region was between 1 and 2 m thick and covered from 8:10 to 10:10 of the sea surface.

Methods

Ice Algae

The mixed slurry and pieces of ice were transferred to the ship

immediately after collection and placed in shallow plastic trays at low light. The pieces of ice were slowly melted by placing the trays in a water bath at about 10°C. The temperature of the slurry was never allowed to rise above -1.5°C. Samples were dispensed when large lumps had broken down into small granules of ice.

Productivity

Primary productivity was measured using the ^{14}C technique and the oxygen evolution method. The ^{14}C method was essentially as described in Strickland and Parsons (1972). 25 µci of sodium bicarbonate ^{14}C was added to approximately 100 ml of sample. A total of 42 light and 2 dark bottles were filled for each experiment. Incubations were done in temperature controlled incubators illuminated by 2000 W tungsten halogen lamps (New Haline OHS 2000) (Irwin et al 1983).

A second series of experiments were run in parallel using an incubator of different design. In this incubator square cuvettes (nominal capacity 110 ml) were used as the sample container. Illumination was provided by a 250 watt tungsten-halogen lamp (Gilway technical lamp # L7391). The output from the lamp passed through a beam collimator and then through a series of mirrors to give desired light levels (Larsen, in prep). Temperature control was achieved in the usual manner.

For oxygen experiments the high precision Winkler method of Williams and Jenkinson (1982) was used. 42 light, 3 dark and 3 time zero bottles were filled for each experiment. The time zero bottles were pickled immediately. Incubation times for all three types of experiments ranged from 3 to 4 hours.

Photosynthetic Action Spectra

The spectral distribution of the initial slope, α, of the PI curve was

investigated using measurements of photosynthesis on a modified photosynthetron (Lewis and Smith, 1983). 1 mci of sodium bicarbonate ^{14}C was added to 125 ml of unconcentrated sample. 1 ml aliquots were dispensed into 7 ml glass vials. The vials were placed into a temperature controlled bored aluminum block which admitted light from below. The aluminum block was mounted on a glass cuvette, 5 cm thick, through which sea water was pumped to remove heat from the light source. The light source was a 2000 watt tungsten-halogen lamp (New Haline OHD 2000). Custom built narrow band-pass optical filters (P.T.R. Optics, Waltham, Mass.) provided 12 wavebands from 400 nm to 675 nm every 25 nm with the half maximum band-pass equal to 25 nm. Variations in intensity within a band-pass was achieved by placing nickel neutral density filters (Perforated Products) over the narrow band-pass filter.

Incubation periods were one hour at which time 0.5 ml of 10N hydrochloric was added to each vial to remove inorganic $H^{14}CO_3$. Vials were shaken in a fume hood for one hour and then the acid was neutralised with 0.5 ml of 10N sodium hydroxide. 5 ml of scintillation cocktail (BDH # R046967) was added and vials counted in the usual way.

Chlorophyll a

Replicate 50 ml chlorophyll samples were filtered onto 25 mm Whatman GF/F filters. Chlorophyll was extracted in 85% acetone at 0°C in the dark for 24 hours. Chlorophyll concentrations were estimated using the fluorometric technique of Yentsch and Menzel (1963) as modified by Holm Hansen et al (1965).

Organic Particulates

Samples for particulate organic carbon and nitrogen were filtered onto precombusted Whatman GF/F filters. Filters were analysed using the method

described in Irwin et al (1982)

Nutrients

Three inorganic nutrients were routinely measured from each sample. Samples were stored frozen at -20°C and later analysed in the laboratory. Inorganic phosphate, silicate and nitrate were measured on a Technicon II autoanalyser using industrial methods 155-71W 186-72W and 158-71W respectively.

Incubation and Incident Light

Photosynthetically active radiation (P.A.R.) was measured at each bottle position in the incubators and at each vial position in the photosynthetron using a Biospherical Instruments QSL100 quantum meter.

Total incident radiations was measured with an Eppley 40 Junction black and white pyranometer. Incident PAR was measured with a Licor Li 190S quantum sensor. The output of both instruments was integrated and logged each hour on a Licor Li 550 printing integrator.

Estimation of photosynthetic parameters

Measurements of specific production P^B and irradiance I were used to estimate parameters in the equation of Platt et al (1981)

$$P^B = P_s \left(1 - \ell^{-\alpha I/P_s}\right) \ell^{-\beta I/P_s}$$

P_s (mg C mg chl^{-1} h^{-1}) is the light saturated rate of photosynthesis in the absence of photoinhibition, α (mg C (mg chl)$^{-1}$ h^{-1} w^{-1} m^{-2}) is the initial slope of the PI curve and β (same units as α) is a parameter that characterises photoinhibition. Complete details of the fitting routine are given in Irwin et al (1982) and a discussion of the mathematical basis for this technique is in Irwin et al (1980).

Acknowledgements

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Light saturation and related biomass and nutrient data

Units

P = mg C m^{-3} h^{-1} (mg chl)$^{-1}$

I = W m^{-2}

P_s = mg C mg Chl^{-1}

α = mg C (mg Chl)$^{-1}$ h^{-1} w^{-1} m^{-2}

β = mg C (mg Chl) h^{-1} w^{-1} m^{-2}

Organic particulates are in mg m^{-3} and inorganic nutrients are in mg at m^{-3}. The 90% confidence interval for P_s, α and β are shown in the closed brackets below the estimates for each parameter.

LABRADOR SEA 1984

LAT 52 44.20'N LONG 53 39.60'W DATE 16/03/84 DEPTH 5 M

I	P	I	P	I	P	I	P
330	3.19	427	3.48	415	2.64	397	3.94
295	3.90	291	3.55	239	4.31	231	3.99
174	4.15	171	4.07	159	4.40	140	4.52
118	4.36	112	3.61	89	4.14	73	4.13
68	3.59	56	3.48	54	3.94	43	3.90
38	3.39	32	3.30	26	2.75	23	3.09
21	2.71	17	2.30	15	1.58	12	1.72
11	1.31	9	.91	8	.93	7	.89
5	.21	5	.44	4	.42	4	.23
3	.18	3	.10				

PARAMETER VALUES

PS :	4.76	ALPHA :	.161	BETA :	.0038
(4.54,	4.98)	(.151,	.171)	(.0028,	.0049)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	4.0 C
CHLOROPHYLL :	.08	NITRATE :	9.18
CARBON :	94	SILICATE :	9.44
NITROGEN :	7	PHOSPHATE :	.97

LABRADOR SEA 1984

LAT 52 44.20'N LONG 53 39.60'W DATE 16/03/84 DEPTH 5 M

I	P	I	P	I	P	I	P
478	3.46	391	3.11	299	3.32	279	2.94
247	3.21	223	3.45	203	2.33	187	2.97
140	3.39	120	3.22	94	2.72	87	3.56
83	3.09	76	3.06	74	3.14	66	2.85
45	3.14	41	3.11	31	2.83	29	2.14
29	2.62	22	1.91	16	1.62	10	1.16
8	1.15	5	.67	4	.59	3	.65
2	.30	1	.26	1	.15	.9	.17
.6	.20	.5	.51	.4	.12	.3	.04
.3	.03	.2	.05	.2	.00		

PARAMETER VALUES

PS : 3.19 (3.09, 3.30)

ALPHA : .164 (.152, .177)

BETA : .0000 (-.0005, .0005)

SAMPLE TEMP -1.8 C

INCUBATION TEMP 2.0 C

CHLOROPHYLL	.08	NITRATE	9.18
CARBON	94	SILICATE	9.44
NITROGEN	7	PHOSPHATE	.97

LABRADOR SEA 1984

LAT 52 53.50'N LONG 53 14.04'W DATE 17/03/84 DEPTH 25 M

I	P	I	P	I	P	I	P
434	1.74	458	2.31	367	2.07	351	2.35
247	2.00	251	2.26	199	2.21	191	1.92
171	2.41	144	2.13	132	2.46	118	2.42
92	2.38	88	2.53	80	2.12	69	2.32
49	2.13	44	2.04	37	1.89	30	1.94
26	1.66	22	1.46	20	1.33	16	1.21
16	.97	13	.93	12	.83	9	.50
8	.49	7	.33	6	.34	5	.26
4	.23	4	.16	3	.15	3	.07
2	.07	2	.05	2	.09		

PARAMETER VALUES

PS : 2.56 (2.45, 2.67)

ALPHA : .091 (.086, .097)

BETA : .0014 (.0009, .0019)

SAMPLE TEMP -1.8 C

INCUBATION TEMP .5 C

CHLOROPHYLL : .10

CARBON : 76

NITROGEN : 7

NITRATE : 9.22

SILICATE : 7.11

PHOSPHATE : .67

LABRADOR SEA 1984

LAT 52 53.50'N LONG 53 14.04'W DATE 17/03/84 DEPTH 25 M

T	P	I	P	I	P	I	P
339	2.35	295	1.85	267	2.35	235	1.86
307	2.02	187	1.99	179	1.95	112	2.25
94	1.98	87	2.05	79	1.98	69	1.89
61	1.62	32	1.59	29	1.62	26	1.52
20	1.31	15	1.12	11	1.01	8	.83
7	.74	5	.35	3	.29	3	.26
2	.18	2	.10	1	.10	1	.04
.6	.07	.4	.03	.3	.10	.3	.00
.2	.10	.1	.07				

PARAMETER VALUES

PS : 2.05 (1.96, 2.13)

ALPHA : .106 (.099, .113)

BETA : .0000 (-.0004, .0004)

SAMPLE TEMP -1.8 C

INCUBATION TEMP .6 C

CHLOROPHYLL	: .10	NITRATE	: 9.22
CARBON	: 76	SILICATE	: 7.11
NITROGEN	: 7	PHOSPHATE	: .67

LABRADOR SEA 1984

LAT 52 53.50'N		LONG 53 14.04'W		DATE 17/03/84		TCE ALGAE	
I	P	I	P	I	P	I	P
311	1.47	231	1.45	175	2.35	140	1.52
198	2.09	108	2.01	99	2.41	85	1.95
71	1.82	70	1.68	56	2.37	45	2.21
45	1.94	35	2.40	32	1.88	24	1.59
23	2.27	20	1.69	16	.79	16	1.52
10	.86	7	.52	4	.22	4	.33
3	.08	2	.12	2	.05	1	.08
1	.03	.6	.02	.6	.02	.4	.02
.4	.01	.3	.02	.3	.01	.2	.01
.2	.01	.1	.01				

PARAMETER VALUES

PS : 2.52	ALPHA : .125	BETA : .0046
(2.27, 2.76)	(.110, .140)	(.0025, .0067)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	.5 C
CHLOROPHYLL :	39.81	NITRATE :	5.96
CARBON :	2887	SILICATE :	6.46
NITROGEN :	449	PHOSPHATE :	1.62

LABRADOR SEA 1984

LAT 52 21.20'N LONG 53 18.24'W DATE 18/03/84 DEPTH 5 M

I	P	I	P	I	P	I	P
411	4.27	315	2.21	299	2.22	275	2.32
222	2.44	215	2.59	211	2.34	163	2.07
155	2.24	149	2.41	128	2.43	112	2.27
108	2.26	92	2.19	76	2.48	68	2.32
63	2.10	50	2.35	47	2.54	37	2.05
35	1.88	28	1.71	22	1.49	22	1.28
18	1.15	15	1.09	12	.83	11	.80
9	.74	7	.66	7	.55	6	.57
5	.25	4	.32	4	.25	3	.26
3	.21	3	.17	2	.08	2	.10
2	.09	1	.07				

PARAMETER VALUES

PS : 2.51 (2.41, 2.60)

ALPHA : .099 (.094, .104)

BETA : .0008 (.0003, .0012)

SAMPLE TEMP -1.8 C

INCUBATION TEMP 2.0 C

CHLOROPHYLL	: .20	NITRATE	: 8.54
CARBON	: 90	SILICATE	: 9.27
NITROGEN	: 6	PHOSPHATE	: .87

LABRADOR SEA 1984

LAT 52 21.20'N		LONG 53 18.24'W		DATE 18/03/84		DEPTH 5 M	
I	P	I	P	I	P	I	P
447	2.02	355	1.84	307	1.89	275	1.91
239	1.73	211	2.27	191	2.09	175	2.15
134	2.26	110	1.78	89	2.01	69	2.06
66	1.89	63	2.04	46	1.67	38	1.44
36	1.57	28	1.57	25	1.47	23	1.24
16	1.00	12	.80	9	.67	7	.59
5	.32	4	.23	3	.18	2	.19
2	.12	2	.09	1	.10	.9	.09
.4	.07	.3	.01	.2	.06	.2	.03
.1	.05						

PARAMETER VALUES

PS : 2.14	ALPHA : .084	BETA : .0006
(2.06, 2.23)	(.079, .089)	(.0002, .0010)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	.5 C
CHLOROPHYLL :	.20	NITRATE :	8.54
CARBON :	90	SILICATE :	9.27
NITROGEN :	6	PHOSPHATE :	.87

LABRADOR SEA 1984

LAT 51 58.70'N		LONG 53 5.3P'W		DATE 19/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
311	3.10	231	2.76	175	2.91	140	3.03
198	2.98	99	3.13	85	3.15	71	2.68
70	2.49	45	2.45	45	2.72	35	2.40
32	2.46	29	2.35	24	1.92	23	2.68
20	1.92	16	1.24	16	1.46	11	1.29
10	.78	7	.63	4	.28	4	.37
3	.17	2	.10	2	.06	1	.05
1	.04	.6	.01	.6	.01	.4	.01
.4	.00	.3	.00	.2	.00	.2	.00
.1	.00						

PARAMETER VALUES

PS :	3.23	ALPHA :	.136	BETA :	.0003
(3.26,	3.20)	(.127,	.146)	(-.0007,	.0013)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL :	76.50	NITRATE :	11.00
CARBON :	5221	SILICATE :	3.14
NITROGEN :	642	PHOSPHATE :	1.22

LABRADOR SEA 1984

LAT 51 58.70'N LONG 53 5.38'W DATE 19/03/84 TCE ALGAE

T	P	T	P	I	P	I	P
467	3.09	391	2.36	267	2.07	243	2.99
223	2.57	219	3.04	179	2.85	151	3.03
151	2.57	116	2.65	116	2.49	85	2.86
79	2.60	53	2.51	42	2.44	37	2.38
31	2.14	22	1.82	15	1.24	14	1.22
10	.70	9	.68	7	.55	7	.49
5	.30	4	.33	3	.19	3	.17
3	.09	2	.17	2	.03	2	.06
1	.03	1	.02	.9	.02	.9	.02
.7	.01						

PARAMETER VALUES

PS : 2.87 (2.71, 3.03) ALPHA : .108 (.099, .117) BETA : .0006 (-.0001, .0013)

SAMPLE TEMP -1.8 C INCUBATION TEMP .0 C

CHLOROPHYLL	62.83	NITRATE	11.00
CARBON	5221	SILICATE	3.14
NITROGEN	642	PHOSPHATE	1.22

LABRADOR SEA 1984

LAT 51 45.15'N LONG 53 5.13'W DATE 20/03/84 ICE ALGAE

T	P	T	P	I	P	I	P
300	3.20	311	3.10	175	2.26	108	2.28
85	2.35	71	2.31	70	2.29	56	2.38
45	2.28	35	2.12	32	2.01	29	1.94
24	1.84	23	2.12	20	1.72	16	1.42
14	1.45	11	.94	10	.79	7	.57
4	.34	4	.48	3	.14	2	.06
2	.08	1	.06	1	.04	.6	.02
.6	.02	.4	.02	.4	.01	.3	.01
.3	.01	.2	.01	.1	.00	.1	.01

PARAMETER VALUES

PS : 2.61 (2.47, 2.76)

ALPHA : .122 (.113, .132)

BETA : .0000 (-.0007, .0007)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -.2 C

CHLOROPHYLL : 53.56

CARBON : 4594

NITROGEN : 663

NITRATE : 16.72

SILICATE : 4.28

PHOSPHATE : 1.45

LABRADOR SEA 1984

LAT 51 45.15'N LONG 53 5.13'W DATE 20/03/84 ICE ALGAE

T	P	T	P	I	P	I	P
427	2.85	391	2.52	267	2.40	243	2.60
223	2.26	219	2.70	179	2.19	151	2.47
151	2.22	116	2.01	116	2.03	85	2.28
79	2.07	73	2.01	53	1.99	50	1.91
42	1.94	31	1.92	22	1.79	22	1.48
15	1.37	14	1.39	10	.96	9	1.05
7	.71	7	.64	5	.41	4	.43
3	.28	3	.22	3	.14	2	.13
2	.10	1	.04	1	.05	1	.02
.9	.04	.9	.01	.7	.01		

PARAMETER VALUES

PS : 2.33 (2.23, 2.44) ALPHA : .116 (.107, .125) BETA : .0000 (-.0005, .0005)

SAMPLE TEMP -1.8 C INCUBATION TEMP -1.0 C

CHLOROPHYLL	62.43	NITRATE	16.72
CARBON	4594	SILICATE	4.28
NITROGEN	463	PHOSPHATE	1.45

LABRADOR SEA 1984

LAT 51 44.76'N		LONG 53 3.31'W		DATE 21/03/84		ICE ALGAE	
T	P	I	P	I	P	I	P
399	2.05	311	1.90	231	1.94	175	1.98
128	1.86	108	1.78	99	1.68	85	1.69
71	1.63	70	1.64	56	1.60	45	1.56
45	1.78	35	1.48	32	1.31	29	1.50
24	1.21	23	1.68	16	1.07	11	.83
10	.47	7	.32	4	.24	4	.30
3	.12	3	.09	2	.04	1	.07
1	.02	.6	.01	.6	.01	.4	.00
.4	.01	.3	.01	.2	.00	.2	.00
.1	.00	.1	.00				

PARAMETER VALUES

PS : 1.95 (1.74, 1.93)

ALPHA : .087 (.080, .094)

BETA : .0000 (-.0004, .0004)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.0 C

CHLOROPHYLL	: 65.23	NITRATE	: 8.53
CARBON	: 3716	SILICATE	: 4.90
NITROGEN	: 538	PHOSPHATE	: 1.67

LABRADOR SEA 1984

LAT 51 44.76'N		LONG 53 3.31'W		DATE 21/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
427	1.54	391	1.38	267	1.50	243	1.46
223	1.57	219	1.50	179	1.55	151	1.59
151	1.55	116	1.58	116	1.50	85	1.62
66	1.54	53	1.43	50	1.25	42	1.34
37	1.34	31	1.34	22	1.15	22	.93
15	.88	14	.94	10	.66	9	.61
7	.43	5	.29	4	.24	3	.14
3	.15	3	.09	2	.09	2	.08
2	.04	1	.02	1	.02	.9	.01
.9	.01	.7	.00				

PARAMETER VALUES

PS :	1.60	ALPHA :	.077	BETA :	.0004
(1.56,	1.65)	(.073,	.080)	(.0002,	.0006)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	62.27	NITRATE :	8.53
CARBON :	3716	SILICATE :	4.90
NITROGEN :	538	PHOSPHATE :	1.67

LABRADOR SEA 1984

LAT 51 40.07'N		LONG 52 49.12'W		DATE 22/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
231	2.34	175	3.03	140	2.94	108	2.67
70	2.39	56	2.28	45	2.28	35	2.08
32	2.55	24	1.96	23	2.17	20	1.88
16	1.95	16	1.62	11	1.49	7	.57
4	.40	4	.45	3	.20	2	.11
2	.03	1	.07	1	.02	.6	.02
.6	.04	.4	.01	.4	.01	.3	.02
.2	.02	.2	.01	.1	.00	.1	.00

PARAMETER VALUES

PS :	2.66	ALPHA :	.155	BETA :	.0000
(2.45,	2.86)	(.141,	.170)	(-.0014,	.0014)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	105.92	NITRATE :	9.54
CARBON :	7754	SILICATE :	5.88
NITROGEN :	1132	PHOSPHATE :	-

LABRADOR SEA 1984

LAT 51 40.07'N LONG 52 49.12'W DATE 22/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
391	2.43	267	2.24	243	2.55	223	2.07
219	2.66	176	2.62	151	2.20	151	2.50
116	2.04	116	2.13	85	2.54	79	1.80
73	1.74	66	2.44	53	2.08	50	1.80
37	1.84	22	1.58	22	1.50	15	1.47
14	1.21	10	.82	9	.84	7	.44
7	.51	5	.28	4	.31	3	.13
3	.20	3	.06	2	.07	2	.04
2	.09	1	.02	1	.00	1	.00
.9	.01	.9	.02				

PARAMETER VALUES

PS :	ALPHA :	BETA :
2.32	.098	.0000
(2.18, 2.46)	(.089, .108)	(-.0007, .0007)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.2 C

CHLOROPHYLL :	105.28	NITRATE :	9.54
CARBON :	7754	SILICATE :	5.88
NITROGEN :	1132	PHOSPHATE :	-

LABRADOR SEA 1984

LAT 51 43.09'N		LONG 52 49.61'W		DATE 23/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
331	2.79	247	2.11	199	3.24	179	3.05
134	3.15	108	3.28	100	3.53	88	2.65
76	3.23	64	3.06	52	3.03	45	3.04
37	3.01	34	3.40	33	3.61	28	1.76
26	1.36	22	1.44	13	1.15	12	1.36
8	1.06	5	.72	5	.69	3	.27
2	.10	2	.14	1	.03	1	.08
.7	.00	.7	.01	.5	.01	.4	.02
.4	.00	.3	.00	.2	.02	.2	.00

PARAMETER VALUES

PS : 3.31 (3.43, 4.39)

ALPHA : .135 (.119, .151)

BETA : .0055 (.0023, .0087)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.0 C

CHLOROPHYLL	: 111.76	NITRATE	: 9.55
CARBON	: 9388	SILICATE	: 4.03
NITROGEN	: 1213	PHOSPHATE	: 1.74

LABRADOR SEA 1984

LAT 51 43.08'N LONG 52 49.61'W DATE 23/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
207	2.25	243	1.99	223	2.26	219	2.62
179	2.26	151	2.53	151	2.34	116	2.17
85	2.38	79	2.34	73	2.16	66	2.28
53	2.33	50	2.19	37	2.17	31	2.14
22	1.89	22	1.80	15	1.52	14	1.40
10	1.04	9	.95	7	.73	7	.68
4	.43	3	.22	3	.24	3	.11
2	.17	2	.06	2	.11	1	.03
1	.01	1	.02	.9	.01	.9	.02
.7	.00						

PARAMETER VALUES

PS :	2.47	ALPHA :	.135	BETA :	.0009
(2.36,	2.58)	(.127,	.144)	(.0002,	.0016)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL :	116.55	NITRATE :	9.55
CARBON :	9388	SILICATE :	4.03
NITROGEN :	1213	PHOSPHATE :	1.74

LABRADOR SEA 1984

LAT 61 43.70'N		LONG 52 46.60'W		DATE 24/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
343	3.16	287	3.23	231	3.41	195	2.67
171	2.81	128	2.58	100	2.34	86	2.66
73	2.41	60	2.30	49	2.33	43	2.14
36	2.51	27	2.04	26	2.00	21	1.64
14	1.27	12	1.15	8	.84	5	.68
5	.56	3	.27	2	.17	2	.10
2	.10	1	.05	.7	.03	.7	.02
.8	.03	.4	.03	.4	.02	.3	.01
.2	.01	.2	.01	.2	.02	.1	.01

PARAMETER VALUES

PS :	2.85	ALPHA :	.118	BETA :	.0030
(2.68,	3.01)	(.108,	.128)	(-.0038,	.0098)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	191.13	NITRATE :	7.47
CARBON :	10847	SILICATE :	7.63
NITROGEN :	1426	PHOSPHATE :	-

LABRADOR SEA 1984

LAT 51 43.70'N LONG 52 46.60'W DATE 24/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
247	2.02	243	2.32	223	1.90	219	2.68
170	2.27	151	2.32	151	1.97	116	1.65
116	2.05	85	2.14	79	1.92	73	2.08
68	1.79	53	2.04	50	1.42	42	1.99
37	1.73	31	1.88	22	1.63	22	1.61
15	1.19	14	1.22	10	.82	9	.85
7	.59	7	.55	5	.36	4	.26
3	.15	3	.19	3	.06	2	.11
2	.05	2	.03	1	.03	1	.03
1	.01	.9	.01	.9	.00		

PARAMETER VALUES

PS : 2.11 (1.96, 2.25)

ALPHA : .104 (.096, .117)

BETA : .0000 (-.0009, .0009)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -.5 C

CHLOROPHYLL	185.99	NITRATE	7.47
CARBON	10847	SILICATE	7.63
NITROGEN	1426	PHOSPHATE	-

LABRADOR SEA 1984

LAT 51 48.89'N		LONG 52 41.23'W		DATE 25/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
215	4.90	191	4.80	167	4.66	136	5.02
100	4.34	86	4.03	68	3.62	59	3.48
46	4.51	38	3.23	36	2.34	29	2.65
27	2.47	22	2.35	16	2.31	15	1.84
10	1.27	8	.98	6	.87	5	.54
2	.33	2	.15	2	.07	1	.05
1	.00	.8	.02	.7	.05	.4	.00
.4	.02	.3	.01	.3	.02	.2	.01
.2	.01	.2	.11				

PARAMETER VALUES

PS : 4.89 (4.13, 5.65)

ALPHA : .135 (.123, .147)

BETA : .0000 (-.0043, .0043)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.0 C

CHLOROPHYLL	34.02	NITRATE	10.72
CARBON	7270	SILICATE	6.81
NITROGEN	1032	PHOSPHATE	1.76

LABRADOR SEA 1984

LAT 51 48.89'N		LONG 52 41.23'W		DATE 25/03/84		ICE ALGAE	
T	P	T	P	I	P	I	P
211	2.93	235	3.06	219	3.40	151	2.63
106	3.11	91	3.45	73	3.09	71	2.80
53	3.35	45	2.80	41	2.55	33	2.85
30	2.68	27	2.42	21	1.93	13	1.85
12	1.87	8	1.21	6	1.02	5	.87
4	.54	4	.52	3	.34	3	.33
2	.17	2	.16	2	.10	1	.10
1	.05	1	.03	.8	.01	.8	.02
.7	.01						

PARAMETER VALUES

PS :	3.24	ALPHA :	.173	BETA :	.0007
(3.10,	3.38)	(.162,	.185)	(-.0001,	.0016)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.2 C
CHLOROPHYLL :	75.02	NITRATE :	10.72
CARBON :	7270	SILICATE :	6.81
NITROGEN :	1032	PHOSPHATE :	1.76

LABRADOR SEA 1984

LAT 51 49.20'N LONG 52 36.99'W DATE 26/03/84 ICE ALGAE

T	P	I	P	I	P	I	P
439	1.88	327	1.65	267	1.62	223	1.77
193	1.64	144	1.46	124	1.74	104	1.87
70	1.59	69	1.70	49	1.60	38	1.63
34	1.53	27	1.30	24	1.45	21	1.22
16	1.09	15	.73	11	.60	7	.47
5	.38	5	.27	3	.12	2	.07
2	.06	2	.05	1	.03	1	.01
.7	.01	.7	.01	.5	.00	.4	.00
.4	.00	.3	.00	.3	.00	.2	.00
.2	.00						

PARAMETER VALUES

PS : 1.74 (1.66, 1.81)

ALPHA : .088 (.082, .094)

BETA : .0000 (-.0003, .0004)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.0 C

CHLOROPHYLL	: 85.46	NITRATE	: 7.53
CARBON	: 4287	SILICATE	: 3.52
NITROGEN	: 568	PHOSPHATE	: 1.10

LABRADOR SEA 1984

LAT 51 49.20'N LONG 52 36.99'W DATE 26/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
738	2.91	399	2.82	255	2.33	239	2.42
219	2.33	187	2.39	175	2.61	151	2.75
118	2.47	106	2.02	98	2.16	68	2.12
64	1.92	63	2.06	52	2.02	47	1.91
40	2.38	34	1.89	31	1.96	26	1.56
22	1.68	15	1.40	13	1.39	10	.98
9	.87	7	.59	6	.62	5	.38
5	.38	4	.24	3	.10	3	.04
3	.12	2	.04	2	.06	1	.03
1	.03	1	.01	1	.01	.8	.00
.7	.01						

PARAMETER VALUES

PS : 2.44 (2.34, 2.54)

ALPHA : .106 (.098, .115)

BETA : .0000 (-.0003, .0003)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -.2 C

CHLOROPHYLL	82.42	NITRATE	7.53
CARBON	4287	SILICATE	3.52
NITROGEN	568	PHOSPHATE	1.10

LABRADOR SEA 1984

LAT 50 34.60'N		LONG 52 28.96'W		DATE 27/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
454	3.43	327	2.88	275	3.02	239	2.79
191	2.76	159	2.80	148	2.96	124	2.68
108	2.97	90	1.96	78	1.93	57	2.40
58	2.33	48	2.42	46	2.63	41	2.44
38	2.40	30	1.34	28	1.65	23	1.38
17	1.20	17	1.11	10	.71	9	.49
6	.40	5	.26	3	.16	3	.10
2	.06	2	.07	1	.04	.9	.01
.7	.03	.6	.01	.5	.01	.4	.01
.4	.00	.3	.00	.2	.00	.2	.01

PARAMETER VALUES

PS :	2.38	ALPHA :	.085	BETA :	.0010
(2.68,	3.09)	(.078,	.093)	(-.0008,	.0028)

SAMPLE TEMP	-1.9 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	104.80	NITRATE :	9.76
CARBON :	5266	SILICATE :	4.73
NITROGEN :	767	PHOSPHATE :	1.53

LABRADOR SEA 1984

LAT 50 34.60'N		LONG 52 28.96'W		DATE 27/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
279	1.34	251	1.50	191	1.42	155	1.46
132	1.35	132	1.35	104	1.32	87	1.69
89	1.46	71	1.31	59	1.33	57	1.47
44	1.30	41	1.36	38	1.34	30	1.14
22	1.19	16	1.02	12	.90	12	.73
8	.54	7	.50	5	.33	5	.35
3	.19	3	.24	2	.13	2	.14
2	.08	1	.05	1	.04	1	.04
.9	.02	.7	.01	.5	.01	.4	.01
.5	.01	.4	.00				

PARAMETER VALUES

PS : 1.48
(1.42, 1.53)

ALPHA : .088
(.083, .093)

BETA : .0003
(.0000, .0007)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -1.8 C

CHLOROPHYLL	103.92	NITRATE	9.76
CARBON	5266	SILICATE	4.73
NITROGEN	767	PHOSPHATE	1.53

Light saturation data for oxygen experiments and related biomass and inorganic nutrient measurements

Units

P = mg O_2 m^{-3} h^{-1} $(mg\ Chl)^{-1}$

I = W m^{-2}

P_s = mg O_2 mg Chl^{-1} h^{-1}

α = mg O_2 $(mg\ Chl)^{-1}$ h^{-1} w^{-1} m^{-2}

β = mg O_2 $(mg\ Chl)^{-1}$ h^{-1} w^{-1} m^{-2}

Organic particulates are in mg m^{-3} and inorganic nutrients are in mg at m^{-3}. The 90% confidence interval for P_s, α and β are shown in the closed brackets below the estimates for each parameter.

LABRADOR SEA 1984

LAT 51 58.70'N LONG 53 5.38'W DATE 19/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
447	8.32	339	8.34	335	8.25	315	8.59
259	8.34	227	8.33	215	8.04	199	8.53
159	7.99	151	7.92	140	7.79	112	7.71
100	7.21	100	7.33	86	7.04	77	6.45
64	6.23	49	5.18	43	4.39	38	3.62
37	2.73	25	2.04	24	1.91	20	1.64
13	1.22	12	1.26	10	.95	9	.91
7	.68	6	.46	5	.55	4	.55
4	.44	2	.19	1	.27		

PARAMETER VALUES

PS : 10.27 (9.32, 11.22)

ALPHA : .129 (.123, .136)

BETA : .0055 (.0023, .0087)

SAMPLE TEMP -1.8 C

INCUBATION TEMP .0 C

CHLOROPHYLL	68.35	NITRATE	11.00
CARBON	5221	SILICATE	3.14
NITROGEN	642	PHOSPHATE	1.22

LABRADOR SEA 1984

LAT 51 45.15'N		LONG 53 5.13'W		DATE 20/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
443	7.03	343	7.13	303	6.53	267	6.34
211	6.37	207	7.72	167	6.32	144	6.75
132	5.77	112	7.42	96	7.41	94	7.76
83	6.69	73	8.08	67	7.48	60	6.70
45	7.05	41	7.05	39	5.04	30	4.77
27	4.13	23	4.46	20	1.59	17	.84
14	.54	13	.33	11	.16	9	.17
9	.18	7	.03				

PARAMETER VALUES

PS : 8.82	ALPHA : .196	BETA : .0073
(7.32, 10.33)	(.167, .224)	(.0004, .0142)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	58.76	NITRATE :	16.72
CARBON :	4594	SILICATE :	4.28
NITROGEN :	663	PHOSPHATE :	1.45

LABRADOR SEA 1984

LAT 51 44.76'N		LONG 53 3.31'W		DATE 21/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
427	1.18	379	.97	319	1.29	291	1.11
231	1.16	215	1.49	215	1.34	179	1.38
140	1.27	116	1.31	99	1.48	89	1.40
74	1.23	72	1.40	69	1.30	50	1.29
49	1.43	38	1.41	33	1.11	21	1.04
19	1.08	16	1.02	12	.92	11	.64
9	.59	7	.67	5	.48	5	.68
4	.47	3	.52	3	.54	2	.43

PARAMETER VALUES

PS :	1.40	ALPHA :	.119	BETA :	.0007
(1.33,	1.46)	(.107,	.130)	(.0003,	.0010)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.0 C
CHLOROPHYLL :	-	NITRATE :	8.53
CARBON :	3716	SILICATE :	4.90
NITROGEN :	538	PHOSPHATE :	1.67

LABRADOR SEA 1984

LAT 51 40.07'N		LONG 52 49.12'W		DATE 22/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
411	5.18	351	6.34	315	6.05	307	4.56
230	6.39	211	4.59	171	5.28	167	6.12
159	4.57	124	5.78	90	6.08	74	4.96
60	5.63	68	4.78	49	4.27	46	4.55
34	3.48	27	2.73	25	2.89	10	.69
9	.83	6	.36	5	.02	5	.14
2	.02						

PARAMETER VALUES

PS :	6.06	ALPHA :	.153	BETA :	.0017
(5.37,	6.75)	(.134,	.173)	(-.0010,	.0045)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.2 C
CHLOROPHYLL :	108.24	NITRATE :	9.54
CARBON :	7754	SILICATE :	5.88
NITROGEN :	1132	PHOSPHATE :	-

LABRADOR SEA 1984

LAT 61 43.08'N		LONG 52 49.61'W		DATE 23/03/84		ICE ALGAE	
T	P	T	P	I	P	T	P
407	4.59	307	5.45	279	4.67	247	4.99
203	4.76	179	5.08	175	4.89	148	5.23
128	5.44	118	4.89	118	4.85	90	4.92
88	5.26	85	4.72	59	5.31	56	4.52
43	4.64	37	4.29	35	3.90	28	3.33
26	3.16	20	2.50	18	2.27	15	2.06
13	1.65	10	1.16	9	1.08	7	.75
7	.74	5	.46	4	.31	4	.43
3	.06	2	.20	2	.16		

PARAMETER VALUES

PS :	5.65	ALPHA :	.177	BETA :	.0028
(5.37,	5.93)	(.167,	.187)	(.0015,	.0042)

SAMPLE TEMP	-1.9 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL :	122.79	NITRATE :	9.55
CARBON :	9388	SILICATE :	4.03
NITROGEN :	1213	PHOSPHATE :	1.74

LABRADOR SEA 1984

LAT 51 43.70'N		LONG 52 46.60'W		DATE 24/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
447	4.97	375	3.99	255	3.79	247	4.36
195	4.70	187	4.31	136	4.57	124	4.18
124	4.05	96	4.25	96	4.70	90	3.94
78	4.47	67	4.10	57	3.79	45	4.13
41	3.92	31	3.73	25	3.09	20	3.60
16	3.69	13	4.11	10	3.01	9	2.45
7	2.20	6	2.95	4	1.69		

PARAMETER VALUES

PS : 4.19
(4.03, 4.35)

ALPHA : .536
(.474, .598)

BETA : .0000
(-.0009, .0009)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -.5 C

CHLOROPHYLL	: 197.98	NITRATE	: 7.47
CARBON	: 10847	SILICATE	: 7.63
NITROGEN	: 1426	PHOSPHATE	: -

LABRADOR SEA 1984

LAT 51 48.89'N LONG 52 41.23'W DATE 25/03/84 ICE ALGAE

T	P	T	P	I	P	I	P
431	8.78	399	11.43	263	9.55	124	10.84
108	8.93	67	9.36	49	8.50	39	8.06
34	10.19	28	6.37	25	8.66	20	6.59
15	4.48	13	7.08	10	3.27	7	3.84
4	4.37	3	2.01	2	1.24	2	2.37
1	1.86	.7	.82				

PARAMETER VALUES

PS : 9.54 (8.85, 10.49)

ALPHA : .628 (.532, .725)

BETA : .0000 (-.0032, .0032)

SAMPLE TEMP -1.8 C

INCUBATION TEMP -.2 C

CHLOROPHYLL	72.43	NITRATE	10.72
CARBON	7270	SILICATE	6.81
NITROGEN	1032	PHOSPHATE	1.76

LABRADOR SEA 1984

LAT 51 49.20'N		LONG 52 36.99'W		DATE 26/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
439	4.61	343	3.30	291	4.75	267	4.83
231	3.25	199	3.51	183	4.94	132	5.48
100	4.99	72	3.45	64	4.14	33	3.11
21	3.28	18	3.16	14	2.67	12	1.31
9	1.66	7	2.39	5	1.15	4	1.13
4	.38	1	.49				

PARAMETER VALUES

PS :	4.40	ALPHA :	.249	BETA :	.0005
(3.93,	4.87)	(.204,	.293)	(-.0015,	.0025)

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.2 C
CHLOROPHYLL :	80.18	NITRATE :	7.53
CARBON :	4287	SILICATE :	3.52
NITROGEN :	568	PHOSPHATE :	1.10

Photosynthetic Action Spectra

Units

P = mg C m^{-3} h^{-1} $(mg\ chl)^{-1}$

I = W m^{-2}

P_s = mg C mg Chl^{-1}

α = mg C $(mg\ Chl)^{-1}$ h^{-1} w^{-1} m^{-2}

β = mg C (mg Chl) h^{-1} w^{-1} m^{-2}

Organic particulates are in mg m^{-3} and inorganic nutrients are in mg at m^{-3}. The 90% confidence interval for P_s, α and β are shown in the closed brackets below the estimates for each parameter.

LABRADOR SEA 1984

LAT 52 53.50'N LONG 53 14.04'W DATE 17/03/84 ICE ALGAE

T	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
.8	.15	.5	.12	.5	.09	.4	.08
.3	.04	.2	.04				
			ALPHA =	.220			
WAVELENGTH 425 NM							
2	.28	2	.28	1	.18	.9	.09
.9	.09	.9	.14	.5	.07	.4	.05
			ALPHA =	.206			
WAVELENGTH 450 NM							
4	.68	4	.56	2	.47	2	.31
1	.10	1	.12	.7	.08	.4	.04
			ALPHA =	.179			
WAVELENGTH 475 NM							
6	.81	6	.65	4	.41	3	.38
1	.15	.8	.08	.4	.05		
			ALPHA =	.123			
WAVELENGTH 500 NM							
5	.64	3	.38	3	.25	3	.39
2	.13	1	.18	1	.11	.6	.04
			ALPHA =	.125			
WAVELENGTH 525 NM							
6	.66	4	.44	3	.22	2	.31
1	.11	1	.12	.6	.04	.4	.07
			ALPHA =	.108			

WAVELENGTH 550 NM							
12	1.49	10	1.33	7	.91	6	.75
3	.48	3	.39	.9	.20	.7	.07
			ALPHA =	.126			
WAVELENGTH 575 NM							
13	1.40	12	1.49	7	.78	6	.69
3	.29	3	.22	.8	.15	.6	.11
			ALPHA =	.117			
WAVELENGTH 600 NM							
14	.95	12	.88	8	.56	7	.48
2	.18	1	.17	.6	.04		
			ALPHA =	.067			
WAVELENGTH 625 NM							
16	1.46	15	1.52	8	.64	8	.81
4	.35	3	.36	1	.08	.6	.07
			ALPHA =	.096			
WAVELENGTH 650 NM							
15	1.32	12	1.13	9	.74	8	.59
3	.29	3	.22	.7	.09	.6	.06
			ALPHA =	.090			
WAVELENGTH 675 NM							
15	2.29	12	2.24	9	1.96	9	1.63
5	.66	4	.70	1	.14	.7	.10
			ALPHA =	.173			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	.0 C
CHLOROPHYLL	: 39.81	NITRATE	: 5.96
CARBON	: 2887	SILICATE	: 6.46
NITROGEN	: 449	PHOSPHATE	: 1.62

LABRADOR SEA 1984

LAT 51 58.70'N LONG 53 5.38'W DATE 19/03/84 ICE ALGAE

T	P	T	P	T	P	T	P
WAVELENGTH 400 NM							
1	.11	1	.09	1	.09	.8	.08
.7	.08	.6	.07	.4	.06	.3	.05
			ALPHA =	.052			
WAVELENGTH 425 NM							
2	.13	1	.11	1	.09	1	.08
.6	.09	.5	.08				
			ALPHA =	.044			
WAVELENGTH 450 NM							
5	.20	5	.22	2	.13	2	.08
1	.08	1	.08	.7	.06		
			ALPHA =	.039			
WAVELENGTH 475 NM							
9	.38	7	.37	5	.26	5	.26
2	.23	1	.14	.7	.05		
			ALPHA =	.036			
WAVELENGTH 500 NM							
5	.29	5	.29	4	.16	3	.19
2	.14	2	.12	1	.09	.5	.06
			ALPHA =	.051			
WAVELENGTH 525 NM							
8	.44	5	.31	3	.17	3	.22
2	.09	1	.10	.6	.08	.6	.06
			ALPHA =	.054			

WAVELENGTH 550 NM							
16	.30	9	.25	5	.22	5	.20
4	.19	1	.11	.8	.06		
			ALPHA =	.014			
WAVELENGTH 575 NM							
23	.43	22	.54	10	.38	9	.36
5	.15	4	.14	1	.06	.5	.07
			ALPHA =	.019			
WAVELENGTH 600 NM							
15	.59	7	.31	3	.16	3	.10
1	.11	.6	.06				
			ALPHA =	.039			
WAVELENGTH 625 NM							
24	.76	20	.94	12	.42	10	.49
5	.23	5	.21	2	.08	.3	.07
			ALPHA =	.035			
WAVELENGTH 650 NM							
22	.65	17	.71	10	.44	8	.56
4	.18	4	.22	.9	.08	.7	.07
			ALPHA =	.030			
WAVELENGTH 675 NM							
18	2.29	17	1.53	12	1.08	11	1.44
5	.46	5	.48	2	.13	.8	.20
			ALPHA =	.111			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL :	.20	NITRATE :	8.54
CARBON :	90	SILICATE :	9.27
NITROGEN :	6	PHOSPHATE :	.87

LABRADOR SEA 1984

LAT 51 53.70'N LONG 53 5.38'W DATE 19/03/84 TCE ALGAE

T	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
1	.12	1	.16	1	.11	.8	.11
.7	.07	.6	.07	.4	.04	.3	.03
			ALPHA =	.127			
WAVELENGTH 425 NM							
2	.31	2	.25	2	.23	1	.10
1	.11	1	.17	.8	.09	.6	.04
			ALPHA =	.168			
WAVELENGTH 450 NM							
5	.38	5	.44	3	.36	2	.21
2	.06	1	.10	1	.05	.7	.02
			ALPHA =	.101			
WAVELENGTH 475 NM							
9	1.40	7	.90	5	.50	5	.52
2	.21	2	.20	1	.11	.7	.05
			ALPHA =	.121			
WAVELENGTH 500 NM							
5	.44	5	.52	4	.21	3	.27
2	.09	2	.17	1	.10	.5	.03
			ALPHA =	.111			
WAVELENGTH 525 NM							
8	.90	5	.67	3	.35	3	.34
2	.20	1	.14	.6	.08	.6	.05
			ALPHA =	.123			

WAVELENGTH 550 NM							
16	1.43	15	1.38	9	.75	5	.39
5	.55	4	.39	1	.24	.8	.04
			ALPHA =	.085			
WAVELENGTH 575 NM							
23	1.68	22	1.71	10	.39	9	.79
5	.37	4	.29	1	.18	.5	.22
			ALPHA =	.071			
WAVELENGTH 600 NM							
15	.63	7	.29	4	.17	3	.20
3	.24	2	.08	.8	.03		
			ALPHA =	.041			
WAVELENGTH 625 NM							
24	1.70	20	1.51	12	.89	10	.90
5	.50	5	.41	2	.13	.3	.08
			ALPHA =	.070			
WAVELENGTH 650 NM							
22	1.70	17	1.21	10	.70	8	.56
4	.28	4	.28	.9	.06	.7	.05
			ALPHA =	.077			
WAVELENGTH 675 NM							
18	2.95	17	2.25	12	1.69	11	2.30
5	.91	5	.79	2	.21	.8	.12
			ALPHA =	.153			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL	61.16	NITRATE	11.00
CARBON	5221	SILICATE	3.14
NITROGEN	642	PHOSPHATE	1.22

LABRADOR SEA 1984

LAT 51 45.15'N LONG 53 5.13'W DATE 20/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
1	.08	1	.09	1	.09	.8	.08
.7	.05	.7	.05	.4	.03	.4	.02
			ALPHA =	.087			
WAVELENGTH 425 NM							
2	.22	1	.18	1	.14	1	.08
1	.08	.9	.09	.6	.13	.5	.10
			ALPHA =	.090			
WAVELENGTH 450 NM							
4	.32	4	.26	2	.14	2	.06
2	.07	1	.04	.7	.03		
			ALPHA =	.078			
WAVELENGTH 475 NM							
8	.74	7	.66	5	.38	5	.40
2	.14	2	.14	1	.07	.7	.04
			ALPHA =	.098			
WAVELENGTH 500 NM							
5	.34	5	.34	4	.19	3	.20
2	.12	2	.07	2	.06	.7	.02
			ALPHA =	.078			
WAVELENGTH 525 NM							
8	.71	5	.49	4	.27	3	.27
2	.12	1	.12	.7	.06	.7	.03
			ALPHA =	.096			

WAVELENGTH 550 NM							
16	1.18	14	1.12	9	.61	5	.36
*	.27	4	.30	1	.15	.9	.04
			ALPHA =	.075			
WAVELENGTH 575 NM							
22	1.41	21	1.48	10	.69	9	.63
*	.26	4	.22	2	.19	1	.14
			ALPHA =	.065			
WAVELENGTH 600 NM							
14	.55	7	.24	3	.13	3	.15
3	.14	2	.06	.8	.03		
			ALPHA =	.040			
WAVELENGTH 625 NM							
25	1.48	22	1.51	12	.84	12	.67
6	.45	5	.38	2	.10	.9	.07
			ALPHA =	.062			
WAVELENGTH 650 NM							
21	1.15	16	.83	9	.48	8	.40
4	.19	4	.18	.9	.05	.8	.02
			ALPHA =	.055			
WAVELENGTH 675 NM							
19	2.42	17	2.76	14	1.72	11	2.18
6	.83	5	.76	2	.18	1	.13
			ALPHA =	.140			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-.5 C
CHLOROPHYLL	91.37	NITRATE	11.60
CARBON	5221	SILICATE	3.14
NITROGEN	642	PHOSPHATE	1.22

LABRADOR SEA 1984

LAT 51 45.15'N		LONG 53 5.13'W		DATE 20/03/84		ICE ALGAE	
T	P	T	P	T	P	I	P
WAVELENGTH 400 NM							
1	.09	1	.10	1	.09	.8	.08
.7	.06	.7	.07	.4	.03	.4	.02
			ALPHA =	.096			
WAVELENGTH 425 NM							
2	.22	2	.18	2	.16	1	.08
1	.09	1	.11	.8	.06	.5	.04
			ALPHA =	.124			
WAVELENGTH 450 NM							
4	.30	4	.26	2	.15	2	.09
2	.10	1	.04	.7	.04		
			ALPHA =	.070			
WAVELENGTH 475 NM							
8	.60	7	.55	5	.36	5	.35
2	.16	2	.14	1	.10	.7	.04
			ALPHA =	.077			
WAVELENGTH 500 NM							
5	.37	5	.36	3	.21	2	.17
2	.11	2	.09	.7	.03		
			ALPHA =	.082			
WAVELENGTH 525 NM							
7	.58	5	.43	4	.28	3	.24
2	.15	1	.11	.7	.06	.7	.05
			ALPHA =	.077			

WAVELENGTH 550 NM							
16	.85	14	.80	9	.48	5	.32
5	.27	4	.28	1	.16	.9	.05
			ALPHA =	.050			
WAVELENGTH 575 NM							
22	.98	21	.93	10	.58	9	.55
5	.27	4	.22	2	.16	1	.16
			ALPHA =	.040			
WAVELENGTH 600 NM							
14	.56	7	.24	3	.16	3	.17
3	.16	2	.06	.8	.05		
			ALPHA =	.039			
WAVELENGTH 625 NM							
25	1.08	22	1.12	12	.65	12	.59
6	.38	5	.32	2	.11	.9	.08
			ALPHA =	.044			
WAVELENGTH 650 NM							
21	.96	16	.74	9	.48	8	.42
4	.24	4	.22	.9	.04	.8	.05
			ALPHA =	.045			
WAVELENGTH 675 NM							
17	1.91	14	1.19	11	1.72	6	.68
5	.67	2	.18	1	.12		
			ALPHA =	.107			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.5 C
CHLOROPHYLL	: 48.60	NITRATE	: 16.72
CARBON	: 4594	SILICATE	: 4.28
NITROGEN	: 663	PHOSPHATE	: 1.45

LABRADOR SEA 1984

LAT 51 44.76'N		LONG 53 3.31'W		DATE 21/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
.9	.07	.9	.07	.6	.08	.6	.07
.6	.05	.5	.05	.3	.04	.2	.03
			ALPHA =	.066			
WAVELENGTH 425 NM							
2	.16	1	.14	1	.11	1	.07
1	.07	.9	.09	.6	.06	.5	.04
			ALPHA =	.107			
WAVELENGTH 450 NM							
4	.23	3	.19	2	.10	1	.05
1	.06	.9	.04	.5	.02		
			ALPHA =	.068			
WAVELENGTH 475 NM							
7	.56	6	.55	4	.32	4	.29
2	.12	2	.12	.8	.07	.5	.04
			ALPHA =	.084			
WAVELENGTH 500 NM							
4	.24	4	.22	3	.15	2	.13
1	.09	1	.06	1	.05	.4	.02
			ALPHA =	.064			
WAVELENGTH 525 NM							
7	.58	5	.43	3	.26	3	.25
1	.12	1	.12	.5	.05	.5	.07
			ALPHA =	.085			

WAVELENGTH 550 NM							
15	.98	13	.86	8	.45	5	.32
4	.24	4	.26	1	.14	.7	.05
			ALPHA =	.063			
WAVELENGTH 575 NM							
21	1.05	19	1.29	9	.55	9	.53
4	.24	4	.19	1	.13	.5	.15
			ALPHA =	.054			
WAVELENGTH 600 NM							
13	.54	6	.22	3	.13	3	.15
2	.06	.7	.03				
			ALPHA =	.040			
WAVELENGTH 625 NM							
25	1.14	22	1.13	11	.57	11	.67
5	.34	4	.28	2	.09	.8	.07
			ALPHA =	.047			
WAVELENGTH 650 NM							
20	.99	14	.68	9	.42	7	.35
4	.18	4	.18	.8	.05	.7	.05
			ALPHA =	.048			
WAVELENGTH 675 NM							
19	1.75	16	2.13	13	1.37	10	1.79
6	.65	5	.61	1	.14	.9	.12
			ALPHA =	.111			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 67.39	NITRATE	: 16.72
CARBON	: 4594	SILICATE	: 4.28
NITROGEN	: 663	PHOSPHATE	: 1.45

LABRADOR SEA 1984

LAT 51 44.75'N LONG 53 3.31'W DATE 21/03/84 ICE ALGAE

T	D	T	P	I	P	I	P
WAVELENGTH 400 NM							
.9	.04	.9	.05	.8	.05	.6	.05
.6	.04	.5	.04	.3	.02	.2	.02
			ALPHA =	.039			
WAVELENGTH 425 NM							
2	.10	1	.09	.6	.07	1	.05
1	.05	.9	.05		.04	.5	.02
			ALPHA =	.065			
WAVELENGTH 450 NM							
4	.15	3	.13	2	.07	1	.05
.9	.03	.5	.03				
			ALPHA =	.042			
WAVELENGTH 475 NM							
7	.40	6	.33	4	.20	4	.15
2	.08	2	.08	.8	.05	.5	.05
			ALPHA =	.053			
WAVELENGTH 500 NM							
4	.15	4	.14	3	.09	2	.09
1	.07	1	.04	1	.04	.4	.02
			ALPHA =	.039			
WAVELENGTH 525 NM							
7	.40	5	.25	3	.15	3	.15
1	.08	1	.08	.5	.03	.5	.05
			ALPHA =	.057			

WAVELENGTH 550 NM							
15	.53	13	.48	8	.28	5	.17
4	.13	4	.15	1	.09	.7	.02
			ALPHA =	.035			
WAVELENGTH 575 NM							
21	.62	19	.67	9	.32	9	.32
4	.14	4	.10	1	.08	.5	.10
			ALPHA =	.029			
WAVELENGTH 600 NM							
13	.28	6	.12	3	.08	3	.08
3	.04	.7	.02				
			ALPHA =	.020			
WAVELENGTH 625 NM							
25	.72	22	.72	11	.33	11	.38
5	.18	4	.17	2	.06	.8	.04
			ALPHA =	.030			
WAVELENGTH 650 NM							
20	.60	14	.48	9	.25	7	.22
4	.11	4	.12	.8	.04	.7	.02
			ALPHA =	.030			
WAVELENGTH 675 NM							
16	1.42	13	.79	10	1.20	6	.35
2	.38	1	.09	.9	.06		
			ALPHA =	.087			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 73.87	NITRATE	: 8.53
CARBON	: 3716	SILICATE	: 4.90
NITROGEN	: 538	PHOSPHATE	: 1.67

LABRADOR SEA 1984

LAT 51 40.07'N LONG 52 49.12'W DATE 22/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
.8	.09	.7	.07	.6	.07	.5	.07
.5	.07	.4	.05				
			ALPHA =	.067			
WAVELENGTH 425 NM							
1	.12	1	.13	1	.11	1	.09
.9	.07	.9	.08	.7	.06	.5	.06
			ALPHA =	.085			
WAVELENGTH 450 NM							
3	.21	3	.17	2	.23	2	.10
1	.07	1	.08	.8	.06	.6	.06
			ALPHA =	.065			
WAVELENGTH 475 NM							
6	.57	6	.48	4	.30	3	.27
2	.12	2	.12	.8	.08	.7	.06
			ALPHA =	.089			
WAVELENGTH 500 NM							
3	.19	3	.21	2	.13	2	.12
1	.10	1	.08	1	.07	.5	.06
			ALPHA =	.056			
WAVELENGTH 525 NM							
5	.51	4	.41	3	.24	3	.25
2	.12	1	.12	.6	.09	.6	.06
			ALPHA =	.093			

WAVELENGTH 550 NM							
14	.98	12	.93	7	.50	4	.30
4	.22	3	.23	1	.13	.7	.09
			ALPHA =	.074			
WAVELENGTH 575 NM							
19	1.19	18	1.24	8	.62	8	.54
4	.26	3	.20	1	.15	1	.13
			ALPHA =	.062			
WAVELENGTH 600 NM							
12	.56	6	.83	3	.14	3	.15
3	.12	2	.08	1	.11	.6	.06
			ALPHA =	.045			
WAVELENGTH 625 NM							
22	1.22	20	1.27	10	.58	10	.67
5	.33	4	.26	2	.08	.8	.07
			ALPHA =	.059			
WAVELENGTH 650 NM							
19	1.17	13	.74	8	.45	7	.41
3	.20	3	.17	.8	.07	.7	.06
			ALPHA =	.059			
WAVELENGTH 675 NM							
15	2.65	10	1.45	9	2.07	5	.60
4	.62	1	.13	.8	.10		
			ALPHA =	.188			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 62.27	NITRATE	: 8.53
CARBON	: 3716	SILICATE	: 4.90
NITROGEN	: 538	PHOSPHATE	: 1.67

LABRADOR SEA 1984

LAT 51 40.07'N LONG 52 49.12'W DATE 22/03/94 ICE ALGAE

T	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
.9	.09	.8	.09	.7	.09	.6	.08
.5	.05	.5	.05	.5	.05	.4	.01
			ALPHA =	.123			
WAVELENGTH 425 NM							
1	.16	1	.22	1	.17	1	.07
.9	.07	.9	.09	.7	.06	.5	.03
			ALPHA =	.200			
WAVELENGTH 450 NM							
3	.37	3	.25	2	.16	1	.08
1	.09	.8	.05	.6	.02		
			ALPHA =	.134			
WAVELENGTH 475 NM							
6	1.09	6	.93	4	.59	3	.49
2	.19	2	.16	.8	.10	.7	.03
			ALPHA =	.185			
WAVELENGTH 500 NM							
3	.36	3	.36	2	.19	2	.21
1	.17	1	.10	1	.06	.5	.02
			ALPHA =	.130			
WAVELENGTH 525 NM							
6	1.18	4	.78	3	.44	3	.47
2	.20	1	.17	.6	.07	.6	.04
			ALPHA =	.195			

WAVELENGTH 550 NM							
14	1.61	12	1.53	7	.86	4	.49
4	.37	3	.38	1	.19	.7	.04
			ALPHA =	.125			
WAVELENGTH 575 NM							
19	2.03	18	2.02	8	1.11	8	.97
4	.41	3	.32	1	.21	1	.19
			ALPHA =	.106			
WAVELENGTH 600 NM							
12	.82	6	.36	3	.17	3	.18
3	.18	2	.06	.6	.02		
			ALPHA =	.070			
WAVELENGTH 625 NM							
23	2.13	20	2.16	10	1.07	10	1.24
4	.62	4	.49	2	.13	.8	.07
			ALPHA =	.103			
WAVELENGTH 650 NM							
19	1.96	13	1.72	8	.80	7	.68
3	.31	3	.28	.8	.06	.7	.09
			ALPHA =	.112			
WAVELENGTH 675 NM							
15	3.78	10	2.54	9	3.20	5	1.15
4	1.22	1	.22	.8	.12		
			ALPHA =	.277			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 28.97	NITRATE	: 9.54
CARBON	: 7754	SILICATE	: 5.88
NITROGEN	: 1132	PHOSPHATE	: -99.00

LABRADOR SEA 1984

LAT 51 43.08'N LONG 52 49.61'W DATE 23/03/84 ICE ALGAE

T	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
1	.09	.9	.10	.8	.08	.5	.06
.5	.07	.6	.06	.5	.06	.4	.03
			ALPHA =	.107			
WAVELENGTH 425 NM							
1	.1[illegible]	1	.16	1	.13	.9	.06
.9	.08	.7	.05	.6	.04		
			ALPHA =	.180			
WAVELENGTH 450 NM							
3	.28	2	.19	2	.08	2	.12
1	.07	.9	.04	.7	.03		
			ALPHA =	.106			
WAVELENGTH 475 NM							
[illegible]	.82	5	.67	3	.43	3	.36
2	.14	2	.12	.9	.08	.7	.04
			ALPHA =	.162			
WAVELENGTH 500 NM							
3	.2[illegible]	3	.28	2	.14	2	.15
1	.09	1	.05	.6	.03		
			ALPHA =	.083			
WAVELENGTH 525 NM							
[illegible]	.79	4	.[illegible]4	3	.29	3	.29
1	.1[illegible]	1	.13	.6	.08	.6	.05
			ALPHA =	.145			

WAVELENGTH 550 NM							
11	1.17	10	1.29	6	.63	4	.46
4	.24	3	.31	1	.18	.8	.04
			ALPHA =	.121			
WAVELENGTH 575 NM							
16	1.64	15	1.69	8	.79	7	.71
4	.33	3	.21	1	.19	.9	.17
			ALPHA =	.106			
WAVELENGTH 600 NM							
12	.01	6	.35	4	.18	3	.22
2	.18	2	.07	.6	.04		
			ALPHA =	.064			
WAVELENGTH 625 NM							
19	1.84	18	1.89	9	1.09	9	.90
4	.49	4	.43	1	.11	.8	.08
			ALPHA =	.101			
WAVELENGTH 650 NM							
17	1.82	11	1.52	8	.64	7	.66
3	.30	3	.26	.8	.04	.7	.06
			ALPHA =	.117			
WAVELENGTH 675 NM							
13	3.36	11	2.10	9	3.06	5	1.05
4	1.08	1	.20	.9	.13		
			ALPHA =	.254			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	258.54	NITRATE	9.54
CARBON	7754	SILICATE	5.88
NITROGEN	1132	PHOSPHATE	-99.00

LABRADOR SEA 1984

LAT 51 43.08'N LONG 52 49.61'W DATE 23/03/84 ICE ALGAE

T	P	T	P	T	P	T	P
WAVELENGTH 400 NM							
1	.19	.9	.19	.8	.20	.6	.13
.8	.16	.8	.13	.5	.11	.4	.03
			ALPHA =	.282			
WAVELENGTH 425 NM							
1	.34	1	.35	1	.29	1	.19
.9	.18	.9	.17	.7	.12	.6	.06
			ALPHA =	.413			
WAVELENGTH 450 NM							
3	.42	2	.42	2	.20	2	.31
1	.17	.9	.10	.7	.05		
			ALPHA =	.237			
WAVELENGTH 475 NM							
5	1.0	5	1.17	3	.81	3	.66
2	.31	2	.20	.9	.19	.7	.07
			ALPHA =	.270			
WAVELENGTH 500 NM							
3	.47	3	.47	2	.33	2	.35
1	.30	1	.21	1	.12	.6	.05
			ALPHA =	.154			
WAVELENGTH 525 NM							
6	1.40	4	.98	3	.51	3	.67
1	.38	1	.32	.6	.16	.6	.09
			ALPHA =	.253			

WAVELENGTH 550 NM							
11	1.64	10	1.71	6	1.01	4	.67
4	.51	3	.50	1	.33	.8	.08
			ALPHA =	.170			
WAVELENGTH 575 NM							
16	2.16	15	2.36	8	1.33	7	1.12
4	.69	3	.46	1	.35	.9	.27
			ALPHA =	.137			
WAVELENGTH 600 NM							
12	1.51	6	.69	4	.45	3	.43
2	.34	2	.16	.6	.07		
			ALPHA =	.118			
WAVELENGTH 625 NM							
19	2.64	18	2.59	9	1.65	9	1.38
4	.89	4	.72	1	.24	.8	.16
			ALPHA =	.136			
WAVELENGTH 650 NM							
17	2.56	11	2.41	8	1.28	7	1.27
3	.67	3	.52	.8	.10	.7	.11
			ALPHA =	.167			
WAVELENGTH 675 NM							
13	4.66	11	3.20	9	4.23	5	1.68
4	1.60	1	.41	.9	.29		
			ALPHA =	.346			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 195.58	NITRATE	: 9.55
CARBON	: 9388	SILICATE	: 4.03
NITROGEN	: 1213	PHOSPHATE	: 1.74

LABRADOR SEA 1984

LAT 51 43.70'N		LONG 52 46.60'W		DATE 24/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
.8	.09	.8	.09	.7	.10	.6	.06
.6	.06	.5	.06	.4	.02		
			ALPHA =	.174			
WAVELENGTH 425 NM							
1	.12	1	.13	1	.14	.9	.08
.9	.06	.7	.07	.7	.05	.6	.03
			ALPHA =	.188			
WAVELENGTH 450 NM							
2	.26	2	.18	1	.09	1	.11
1	.07	.8	.04	.6	.02		
			ALPHA =	.139			
WAVELENGTH 475 NM							
5	.78	4	.05	3	.41	3	.35
1	.13	1	.12	.8	.09	.7	.03
			ALPHA =	.183			
WAVELENGTH 500 NM							
2	.26	2	.24	2	.15	1	.10
.9	.05	.6	.03				
			ALPHA =	.148			
WAVELENGTH 525 NM							
5	.88	3	.58	2	.31	2	.35
1	.15	1	.15	.5	.09	.5	.05
			ALPHA =	.182			

WAVELENGTH 550 NM							
9	1.30	8	1.11	5	.62	3	.42
3	.30	2	.33	1	.17	.7	.04
			ALPHA =	.139			
WAVELENGTH 575 NM							
15	1.74	14	1.76	7	.85	6	.84
3	.36	3	.28	1	.18	.9	.1[illegible]
			ALPHA =	.120			
WAVELENGTH 600 NM							
11	.95	6	.41	4	.30	2	.21
2	.18	2	.09	.6	.03		
			ALPHA =	.087			
WAVELENGTH 625 NM							
19	2.02	17	2.03	9	1.13	9	.93
4	.[illegible]	4	.47	1	.12	.7	.09
			ALPHA =	.114			
WAVELENGTH 650 NM							
15	1.62	9	1.40	7	.81	6	.68
3	.34	3	.27	.7	.05	.7	.06
			ALPHA =	.119			
WAVELENGTH 675 NM							
17	2.98	15	3.73	12	2.43	9	3.00
5	1.04	4	1.09	1	.23	.9	.16
			ALPHA =	.211			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 125.19	NITRATE	: 9.55
CARBON	: 9388	SILICATE	: 4.03
NITROGEN	: 1213	PHOSPHATE	: 1.74

LABRADOR SEA 1984

LAT 51 43.70'N		LONG 52 46.60'W		DATE 24/03/34		ICE ALGAE	
T	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
.8	.09	.8	.09	.7	.09	.6	.05
.5	.07	.5	.06	.4	.02		
			ALPHA =	.155			
WAVELENGTH 425 NM							
1	.11	1	.10	1	.13	.9	.07
.8	.05	.7	.05	.7	.05	.6	.03
			ALPHA =	.163			
WAVELENGTH 450 NM							
2	.23	2	.16	1	.08	1	.10
1	.08	.8	.04	.6	.02		
			ALPHA =	.120			
WAVELENGTH 475 NM							
5	.71	4	.59	3	.41	3	.37
1	.13	1	.10	.8	.07	.7	.03
			ALPHA =	.168			
WAVELENGTH 500 NM							
2	.22	2	.22	2	.13	1	.09
.9	.04	.6	.02				
			ALPHA =	.130			
WAVELENGTH 525 NM							
5	.79	3	.52	2	.29	2	.31
1	.15	1	.14	.6	.07	.5	.03
			ALPHA =	.164			

WAVELENGTH 550 NM							
9	1.13	8	1.00	5	.55	3	.36
3	.28	2	.27	1	.16	.7	.03
			ALPHA =	.122			
WAVELENGTH 575 NM							
15	1.54	14	1.57	7	.79	6	.75
3	.34	3	.24	1	.15	.9	.11
			ALPHA =	.107			
WAVELENGTH 600 NM							
11	.88	6	.37	4	.26	2	.19
2	.17	2	.09	.6	.04		
			ALPHA =	.080			
WAVELENGTH 625 NM							
19	1.66	17	1.85	9	1.09	9	.83
4	.50	4	.42	1	.11	.7	.07
			ALPHA =	.099			
WAVELENGTH 650 NM							
15	1.59	9	1.33	7	.72	6	.61
3	.30	3	.24	.7	.05	.7	.05
			ALPHA =	.117			
WAVELENGTH 675 NM							
17	2.94	15	3.70	12	2.32	9	3.04
6	1.02	4	1.07	1	.23	.9	.14
			ALPHA =	.208			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 170.57	NITRATE	: 7.47
CARBON	: 10847	SILICATE	: 7.63
NITROGEN	: 1426	PHOSPHATE	: -99.00

LABRADOR SEA 1984

LAT 51 48.89'N		LONG 52 41.23'W		DATE 25/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
.9	.07	.8	.07	.6	.07	.5	.06
.6	.05	.5	.06	.4	.03		
			ALPHA =	.077			
WAVELENGTH 425 NM							
1	.08	1	.08	1	.09	1	.07
.9	.05	.8	.06	.8	.05	.7	.04
			ALPHA =	.085			
WAVELENGTH 450 NM							
2	.14	2	.10	1	.07	1	.06
1	.06	.9	.03	.7	.03		
			ALPHA =	.071			
WAVELENGTH 475 NM							
5	.44	4	.33	3	.22	3	.17
2	.09	1	.07	.9	.04	.8	.04
			ALPHA =	.102			
WAVELENGTH 500 NM							
2	.15	2	.14	2	.10	2	.10
1	.11	1	.08	1	.07	.7	.06
			ALPHA =	.063			
WAVELENGTH 525 NM							
5	.55	4	.31	2	.17	2	.16
1	.09	1	.09	.7	.07	.6	.05
			ALPHA =	.109			

WAVELENGTH 550 NM							
10	.93	8	.68	6	.38	3	.26
3	.20	2	.17	1	.11	.9	.06
			ALPHA =	.091			
WAVELENGTH 575 NM							
15	1.16	14	1.37	7	.63	7	.55
3	.23	3	.18	1	.11	1	.09
			ALPHA =	.089			
WAVELENGTH 600 NM							
12	.81	6	.32	4	.22	3	.15
2	.15	2	.09	.7	.06		
			ALPHA =	.067			
WAVELENGTH 625 NM							
19	1.64	17	1.84	9	.77	9	.30
4	.38	4	.32	.8	.06	.5	.09
			ALPHA =	.096			
WAVELENGTH 650 NM							
16	1.65	10	1.31	8	.68	6	.59
3	.21	2	.27	.8	.06	.8	.01
			ALPHA =	.109			
WAVELENGTH 675 NM							
16	3.96	12	2.33	5	.88	4	.83
1	.17	1	.10				
			ALPHA =	.251			

SAMPLE TEMP -1.8 C

CHLOROPHYLL : 93.13

CARBON : 10847

NITROGEN : 1426

INCUBATION TEMP -1.8 C

NITRATE : 7.47

SILICATE : 7.63

PHOSPHATE : -99.00

LABRADOR SEA 1984

LAT 51 48.89'N LONG 52 41.23'W DATE 25/03/84 ICE ALGAE

I	P	T	P	I	P	I	P
WAVELENGTH 400 NM							
.9	.08	.8	.09	.8	.08	.6	.07
.6	.06	.6	.05	.4	.02		
			ALPHA =	.135			
WAVELENGTH 425 NM							
1	.09	1	.10	1	.11	1	.07
.9	.05	.8	.05	.8	.03	.7	.03
			ALPHA =	.160			
WAVELENGTH 450 NM							
2	.23	2	.15	1	.07	1	.10
1	.07	.9	.04	.7	.03		
			ALPHA =	.132			
WAVELENGTH 475 NM							
5	.72	4	.47	3	.34	3	.28
2	.11	1	.10	.9	.05	.8	.02
			ALPHA =	.169			
WAVELENGTH 500 NM							
2	.24	2	.20	2	.12	2	.14
1	.15	1	.10	1	.06	.7	.05
			ALPHA =	.122			
WAVELENGTH 525 NM							
5	.80	4	.51	2	.27	2	.28
1	.11	1	.13	.7	.07	.6	.02
			ALPHA =	.175			

WAVELENGTH 550 NM							
10	1.47	8	1.13	6	.68	3	.43
3	.33	2	.29	1	.19	.9	.07
			ALPHA =	.147			
WAVELENGTH 575 NM							
15	1.64	14	1.86	7	.90	7	.90
3	.38	3	.32	1	.17	1	.13
			ALPHA =	.120			
WAVELENGTH 600 NM							
12	1.01	6	.51	4	.37	3	.24
2	.20	2	.14	.7	.06		
			ALPHA =	.084			
WAVELENGTH 625 NM							
19	1.92	17	2.06	9	.96	9	1.12
4	.51	4	.44	.8	.05	.5	.11
			ALPHA =	.109			
WAVELENGTH 650 NM							
16	1.82	10	1.44	8	.86	6	.79
3	.27	2	.38	.8	.09	.8	.09
			ALPHA =	.116			
WAVELENGTH 675 NM							
16	4.31	12	2.71	9	3.37	5	1.21
4	1.23	1	.25	1	.14		
			ALPHA =	.282			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 84.66	NITRATE	: 10.72
CARBON	: 7270	SILICATE	: 6.81
NITROGEN	: 1032	PHOSPHATE	: 1.76

LABRADOR SEA 1984

LAT F1 49.20'N		LONG 52 36.99'W		DATE 26/03/84		ICE ALGAE	
I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
1	.08	1	.09	.9	.09	.8	.07
.7	.07	.7	.06	.5	.03		
			ALPHA =	.081			
WAVELENGTH 425 NM							
1	.12	1	.11	1	.12	1	.08
1	.06	1	.07	.8	.05	.8	.04
			ALPHA =	.120			
WAVELENGTH 450 NM							
3	.27	3	.20	2	.14	2	.08
1	.08	1	.05	.9	.04		
			ALPHA =	.084			
WAVELENGTH 475 NM							
5	.51	5	.41	3	.26	3	.25
2	.19	2	.11	1	.07	.8	.04
			ALPHA =	.095			
WAVELENGTH 500 NM							
4	.30	3	.20	2	.20	2	.13
2	.15	1	.09	1	.08	.7	.04
			ALPHA =	.091			
WAVELENGTH 525 NM							
5	.46	4	.34	3	.22	3	.21
1	.11	1	.10	.7	.05	.7	.07
			ALPHA =	.091			

WAVELENGTH 550 NM							
13	.97	11	.70	10	.73	7	.46
4	.32	4	.22	1	.13	1	.07
			ALPHA =	.070			
WAVELENGTH 575 NM							
14	.92	11	.63	7	.53	4	.31
4	.25	2	.13	1	.11	.8	.10
			ALPHA =	.066			
WAVELENGTH 600 NM							
21	1.05	15	.83	11	.57	10	.56
2	.16	.7	.06	.6	.21		
			ALPHA =	.046			
WAVELENGTH 625 NM							
17	1.18	13	.96	9	.66	7	.48
4	.26	4	.25	1	.06	.7	.06
			ALPHA =	.067			
WAVELENGTH 650 NM							
20	1.29	13	.98	13	1.07	8	.55
5	.35	3	.23	1	.08	.9	.09
			ALPHA =	.069			
WAVELENGTH 675 NM							
16	1.47	15	1.96	11	1.28	5	.60
3	.51	1	.13	.9	.09		
			ALPHA =	.110			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 40.53	NITRATE	: 10.72
CARBON	: 7270	SILICATE	: 6.81
NITROGEN	: 1032	PHOSPHATE	: 1.76

LABRADOR SEA 1984

LAT 51 49.20'N LONG 52 36.99'W DATE 26/03/94 TCE ALGAE

I	D	T	P	I	P	I	P
WAVELENGTH 400 NM							
1	.07	1	.09	.9	.07	.8	.06
.7	.05	.7	.05	.5	.02		
			ALPHA =	.095			
WAVELENGTH 425 NM							
1	.09	1	.08	1	.10	1	.06
1	.04	1	.00	.8	.03	.6	.02
			ALPHA =	.113			
WAVELENGTH 450 NM							
2	.24	3	.18	2	.12	2	.06
1	.06	1	.03	.9	.02		
			ALPHA =	.077			
WAVELENGTH 475 NM							
6	.40	5	.35	3	.22	3	.22
2	.08	2	.09	1	.06	.8	.02
			ALPHA =	.079			
WAVELENGTH 500 NM							
4	.23	3	.15	2	.16	2	.09
2	.13	1	.08	1	.06	.7	.03
			ALPHA =	.072			
WAVELENGTH 525 NM							
5	.38	4	.30	3	.17	3	.15
1	.11	1	.07	.7	.02	.7	.04
			ALPHA =	.078			

WAVELENGTH 550 NM							
13	.77	11	.59	10	.64	7	.42
4	.28	4	.17	1	.11	1	.06
			ALPHA =	.057			
WAVELENGTH 575 NM							
14	.75	11	.71	7	.46	4	.25
4	.21	2	.09	1	.09	.8	.08
			ALPHA =	.056			
WAVELENGTH 600 NM							
21	.97	15	.68	11	.52	10	.54
2	.12	1	.11	.7	.04		
			ALPHA =	.041			
WAVELENGTH 625 NM							
17	1.15	13	.72	9	.59	7	.45
4	.28	4	.23	1	.06	.7	.05
			ALPHA =	.062			
WAVELENGTH 650 NM							
20	1.09	13	.78	13	.91	8	.47
*	.30	3	.18	1	.06	.9	.06
			ALPHA =	.056			
WAVELENGTH 675 NM							
12	1.92	11	1.21	8	1.45	5	.60
3	.48	1	.14	.9	.10		
			ALPHA =	.132			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	: 76.58	NITRATE	: 7.53
CARBON	: 4207	SILICATE	: 3.52
NITROGEN	: 568	PHOSPHATE	: 1.10

LABRADOR SEA 1984

LAT 50 34.50'N LONG 52 28.96'W DATE 27/03/84 ICE ALGAE

I	P	I	P	I	P	I	P
WAVELENGTH 400 NM							
1	.07	.9	.06	.7	.05	.7	.04
.5	.04	.5	.02				
			ALPHA =	.087			
WAVELENGTH 425 NM							
1	.06	1	.06	1	.05	1	.05
.8	.03	.7	.03				
			ALPHA =	.058			
WAVELENGTH 450 NM							
3	.18	3	.13	2	.09	2	.05
1	.04	1	.04	.9	.02		
			ALPHA =	.067			
WAVELENGTH 475 NM							
5	.41	4	.32	3	.20	3	.17
2	.07	2	.07	1	.04	.9	.02
			ALPHA =	.088			
WAVELENGTH 500 NM							
3	.20	2	.12	2	.14	2	.11
1	.06	1	.06	.8	.04		
			ALPHA =	.070			
WAVELENGTH 525 NM							
5	.28	4	.28	3	.14	3	.14
1	.08	1	.06	.8	.04	.7	.02
			ALPHA =	.083			

WAVELENGTH 550 NM							
13	.84	11	.63	9	.64	7	.39
4	.35	4	.17	1	.10	1	.04
			ALPHA =	.064			
WAVELENGTH 575 NM							
14	.84	11	.70	7	.43	4	.22
4	.18	2	.08	1	.07	.9	.05
			ALPHA =	.063			
WAVELENGTH 600 NM							
20	.82	14	.66	11	.48	10	.47
3	.10	1	.10	.7	.03		
			ALPHA =	.041			
WAVELENGTH 625 NM							
17	1.11	14	.74	9	.58	8	.41
4	.22	4	.23	1	.04	.8	.03
			ALPHA =	.061			
WAVELENGTH 650 NM							
19	1.17	13	.78	11	.75	7	.45
4	.27	3	.15	1	.04	.9	.05
			ALPHA =	.063			
WAVELENGTH 675 NM							
17	1.70	16	2.10	12	1.38	9	1.68
5	.54	4	.49	1	.10	1	.07
			ALPHA =	.120			

SAMPLE TEMP	-1.8 C	INCUBATION TEMP	-1.8 C
CHLOROPHYLL	92.57	NITRATE	7.53
CARBON	4287	SILICATE	3.52
NITROGEN	568	PHOSPHATE	1.10

Temperature and salinity at standard oceanographic depths at 3 stations on the Labrador Shelf

LABRADOR SEA 1984

LAT 52 44.20'N	LONG 53 39.60'W	DATE 16/03/84
DEPTH	TEMPERATURE	SALINITY
1	-1.75	33.41
10	-1.80	33.30
20	-1.80	33.30
30	-1.80	33.30
40	-1.79	33.30
50	-1.79	33.34
60	-1.75	33.34
70	-1.43	33.37
80	-1.27	33.57
90	-1.24	33.60
100	-1.23	33.66
125	-1.01	33.71
150	-0.65	33.65

LABRADOR SEA 1984

LAT 52 53.50'N LONG 53 14.04'W DATE 17/03/84

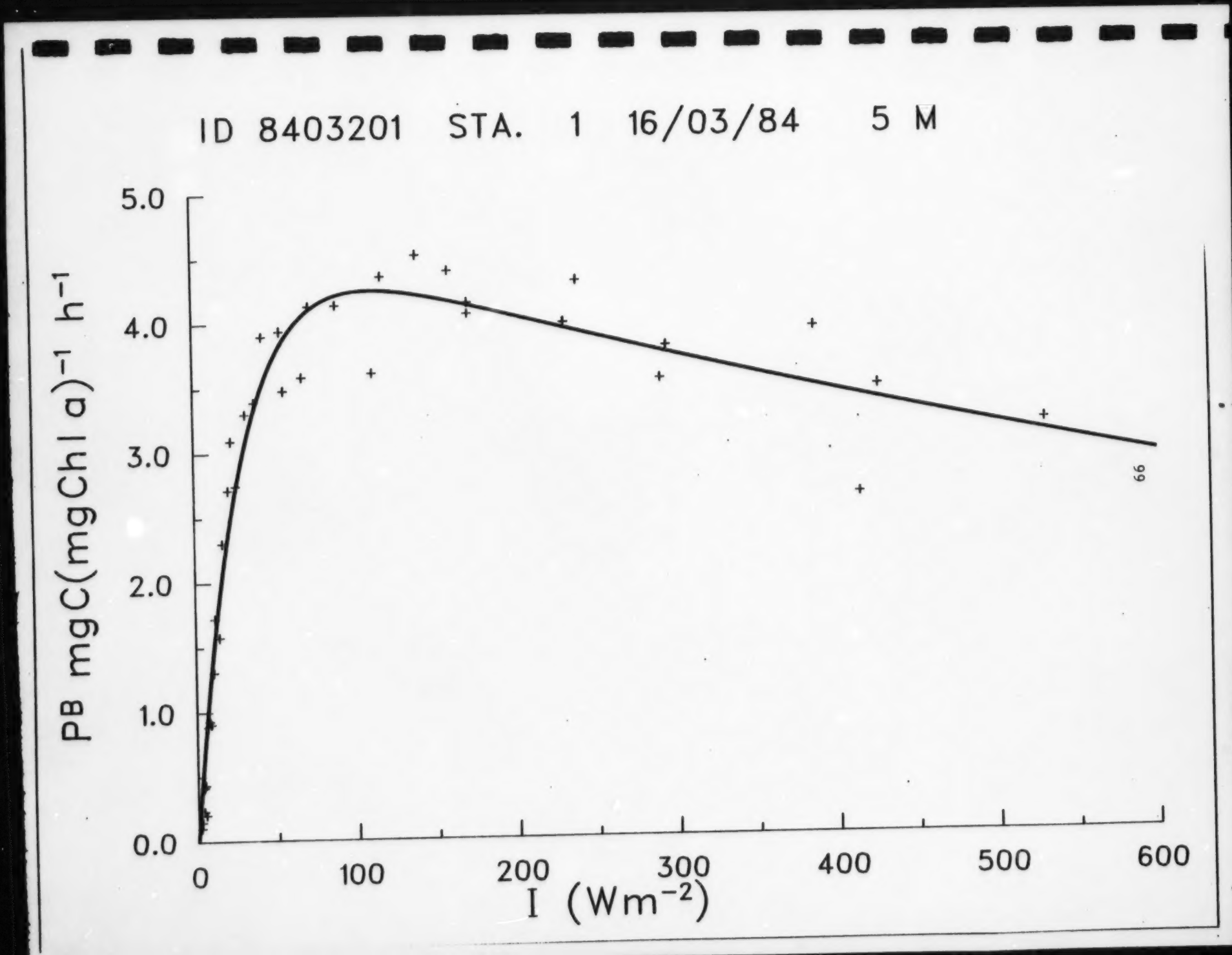
DEPTH	TEMPERATURE	SALINITY
1	-1.76	33.32
10	-1.80	33.30
20	-1.79	33.33
30	-1.79	33.30
46	-1.79	33.32
50	-1.76	33.34
60	-1.71	33.35
70	-1.49	33.48
80	-1.44	33.53
90	-1.33	33.58
100	-1.34	33.60
125	-0.81	33.72
150	-0.55	33.85

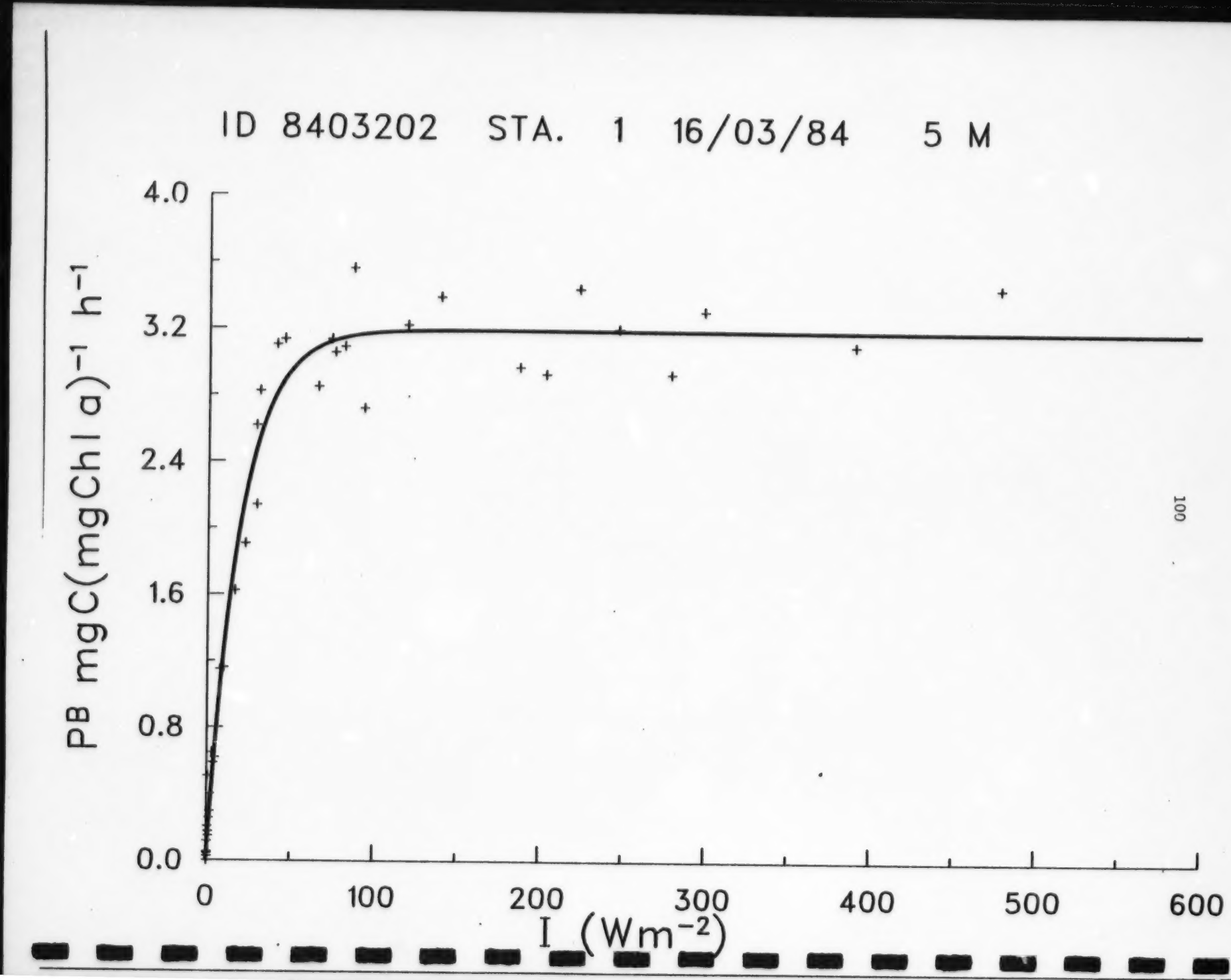
LABRADOR SEA 1984

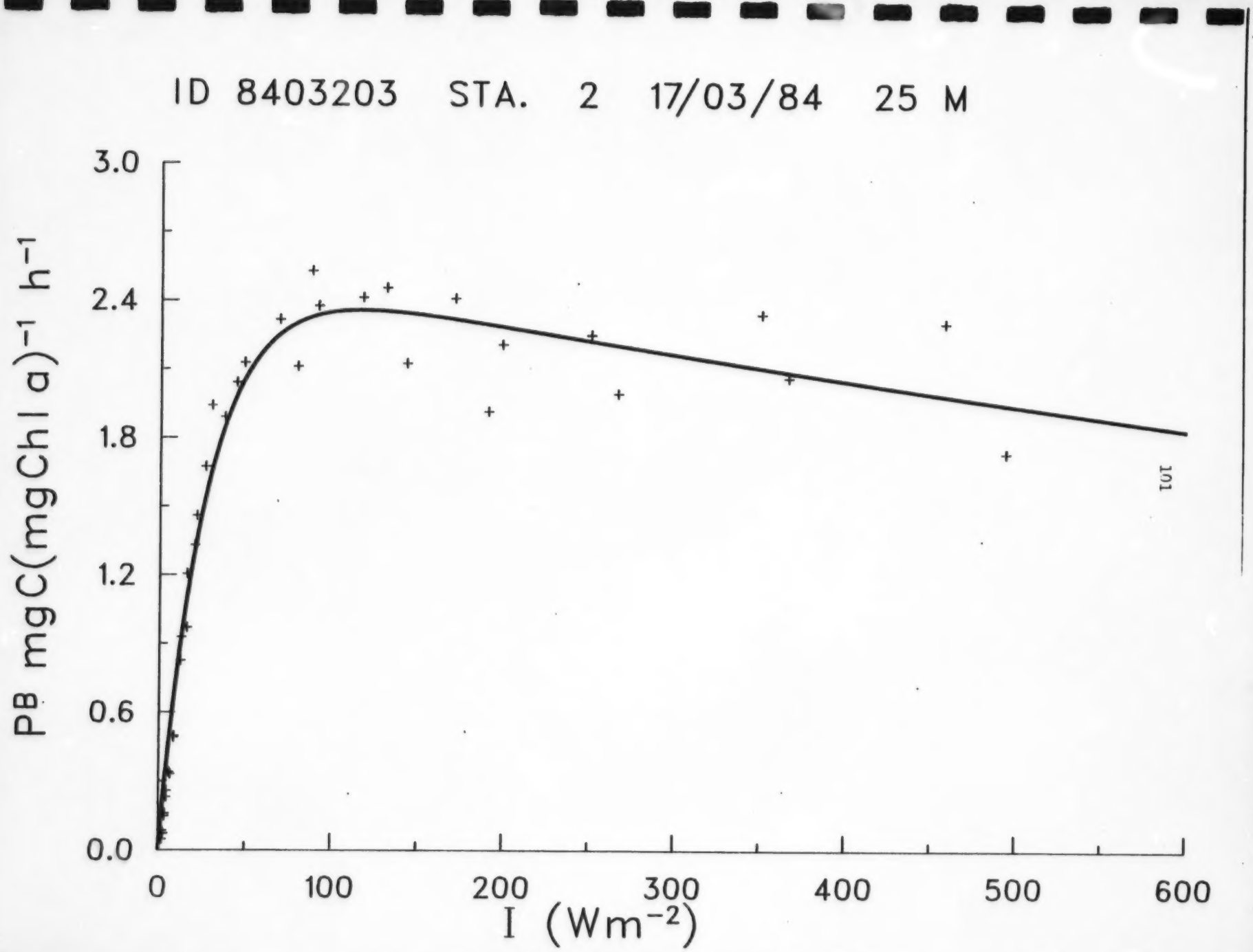
LAT 52 21.20'N LONG 53 18.24'W DATE 18/03/84

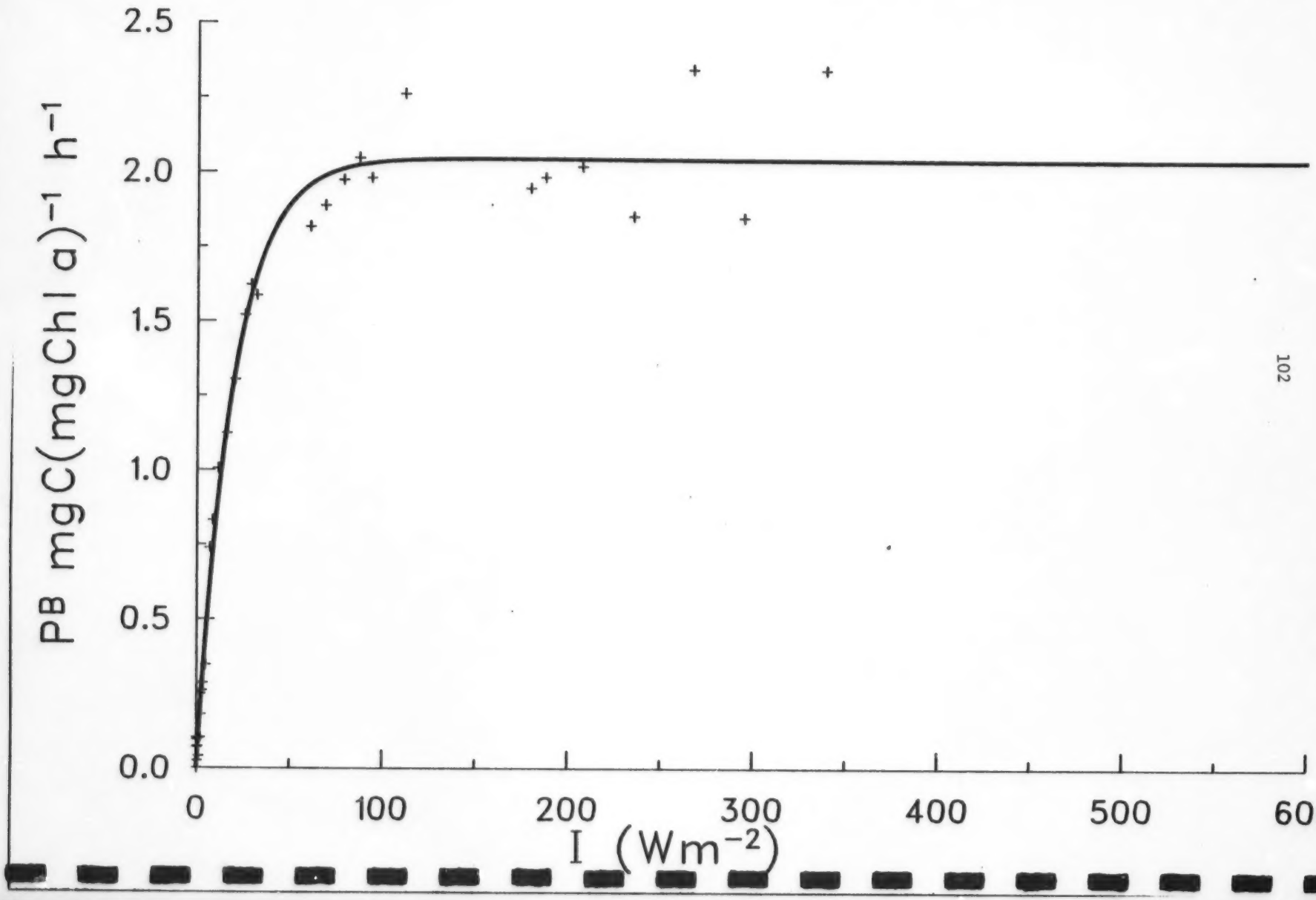
DEPTH	TEMPERATURE	SALINITY
1	-1.79	33.43
10	-1.79	33.43
20	-1.79	33.36
30	-1.79	33.36
40	-1.79	33.35
50	-1.80	33.35
60	-1.79	33.34
70	-1.79	33.37
80	-1.79	33.37
90	-1.77	33.40
100	-1.71	33.42
125	-1.39	33.62
150	-0.10	33.80
175	-0.42	33.88
200	0.01	34.00

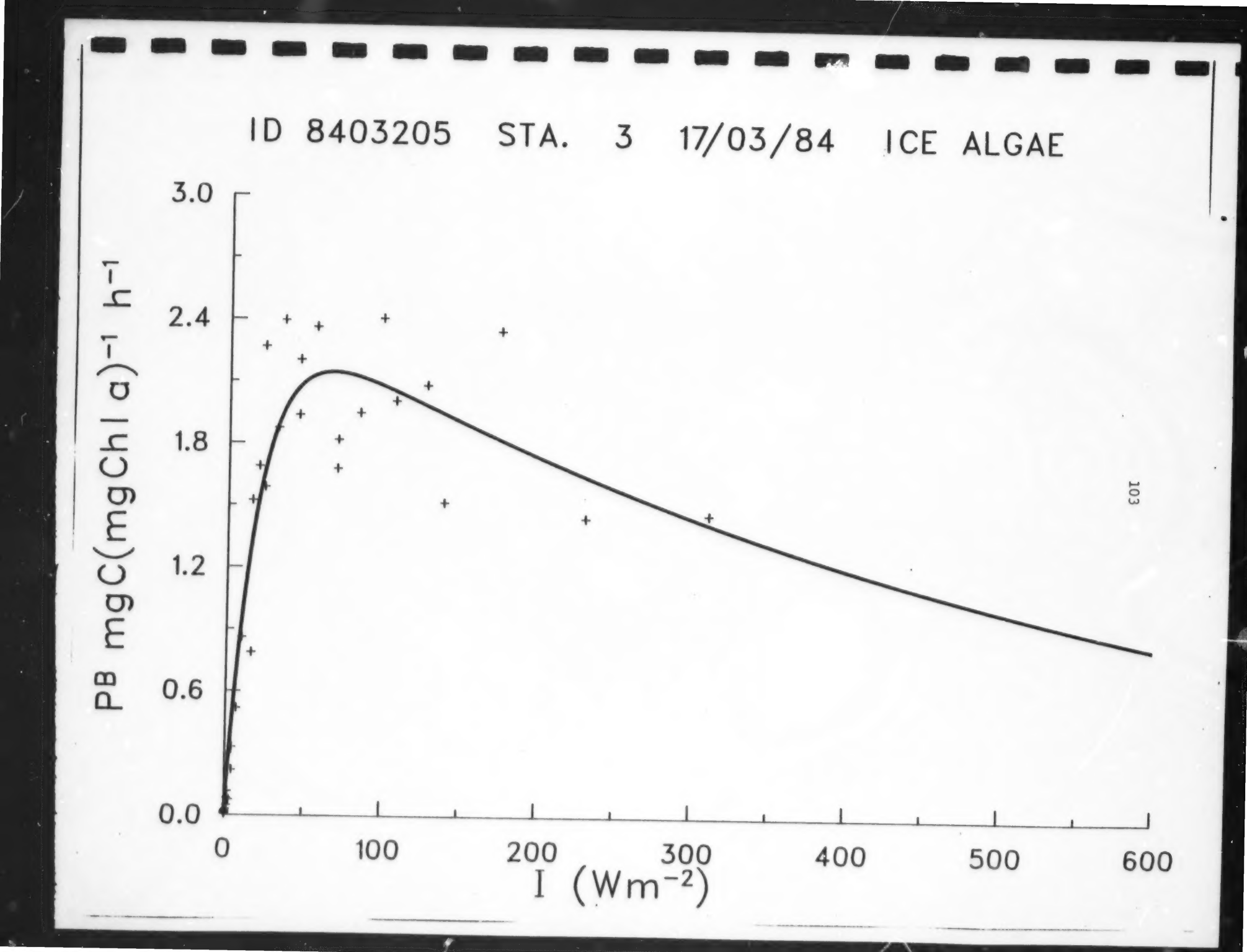
Solid line fit to observed Carbon PI data

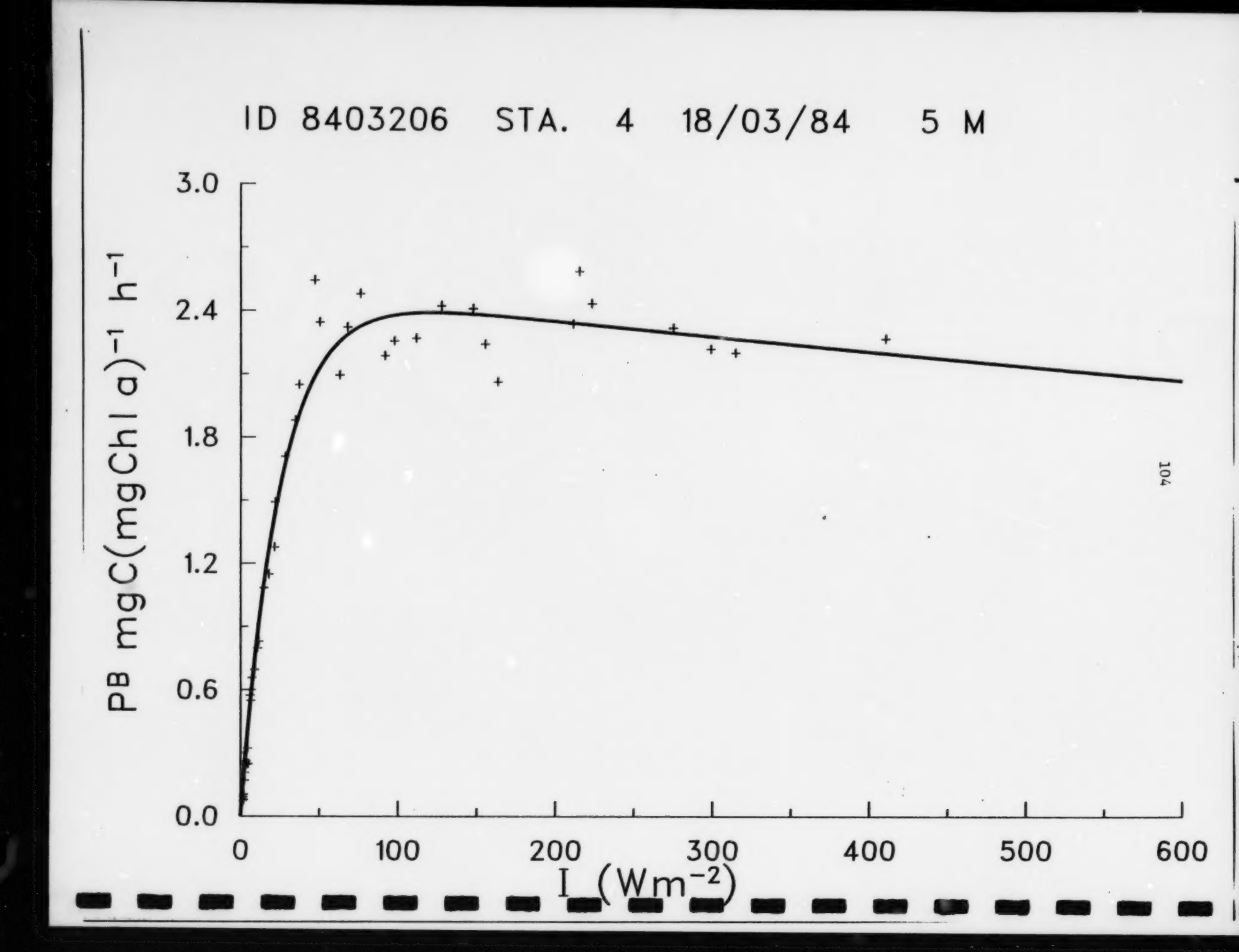

ID 8403201 STA. 1 16/03/84 5 M
5.0
4.0
3.0
2.0
1.0
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
99

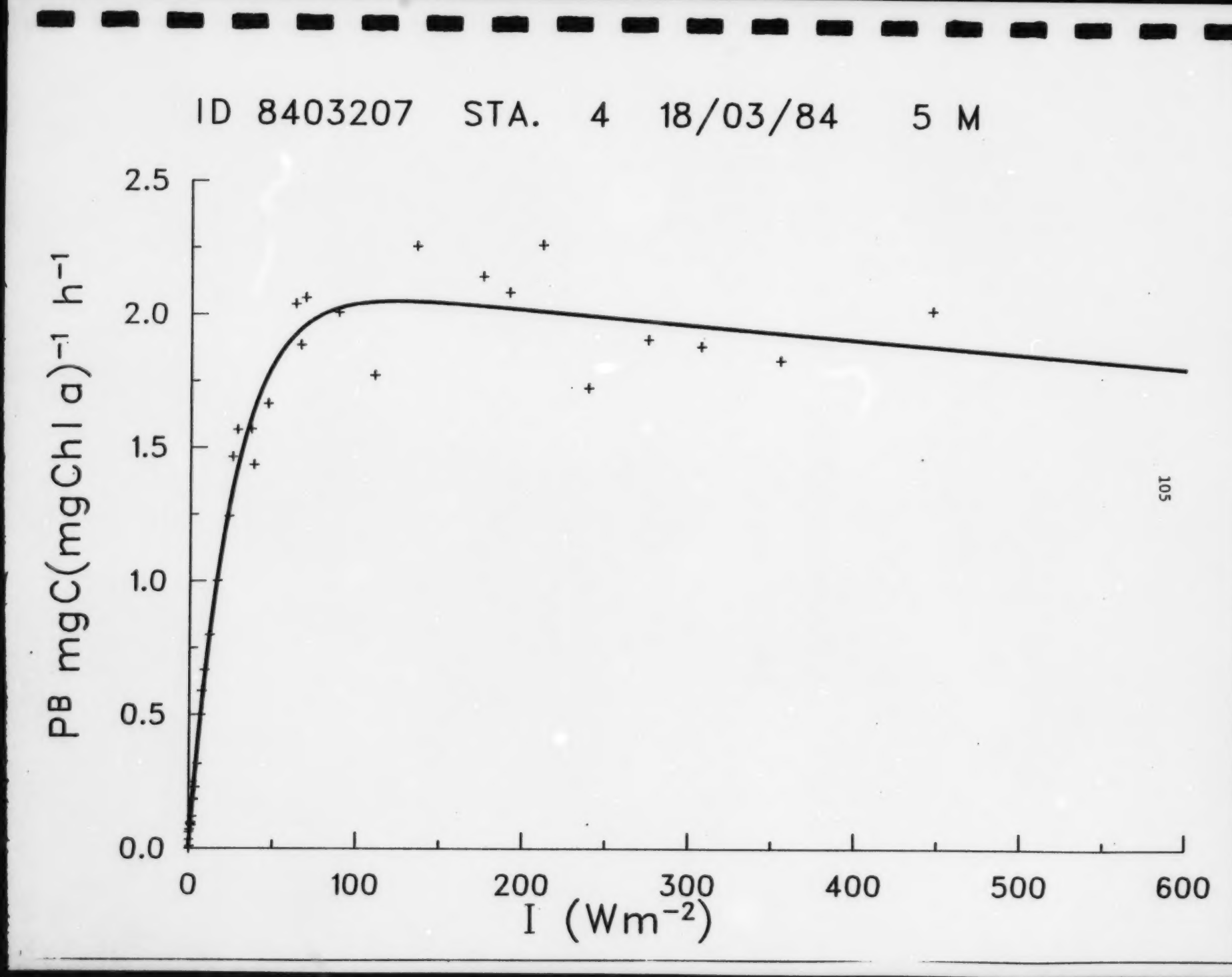

ID 8403202 STA. 1 16/03/84 5 M
4.0
3.2
2.4
1.6
0.8
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
100

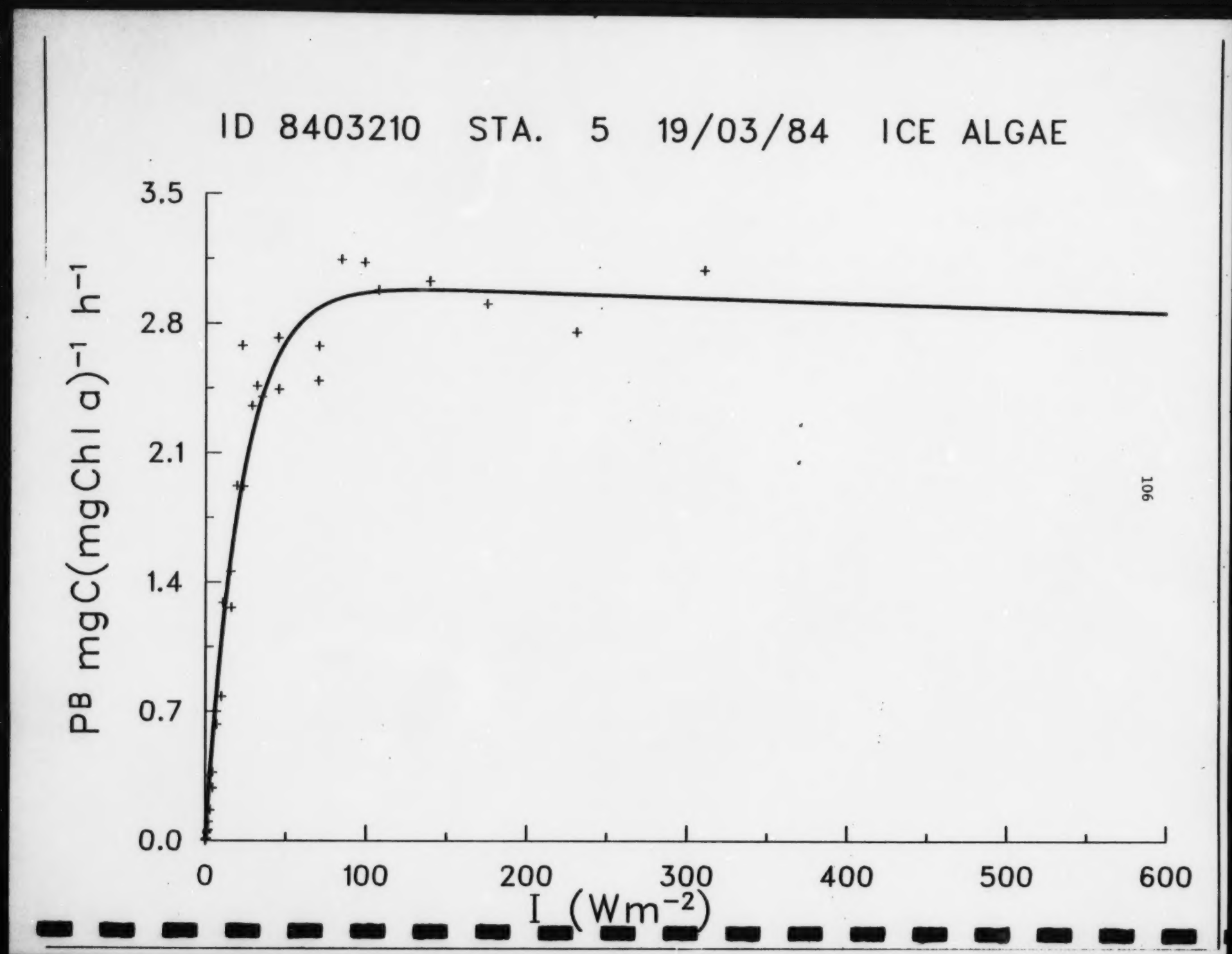

ID 8403203 STA. 2 17/03/84 25 M
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})

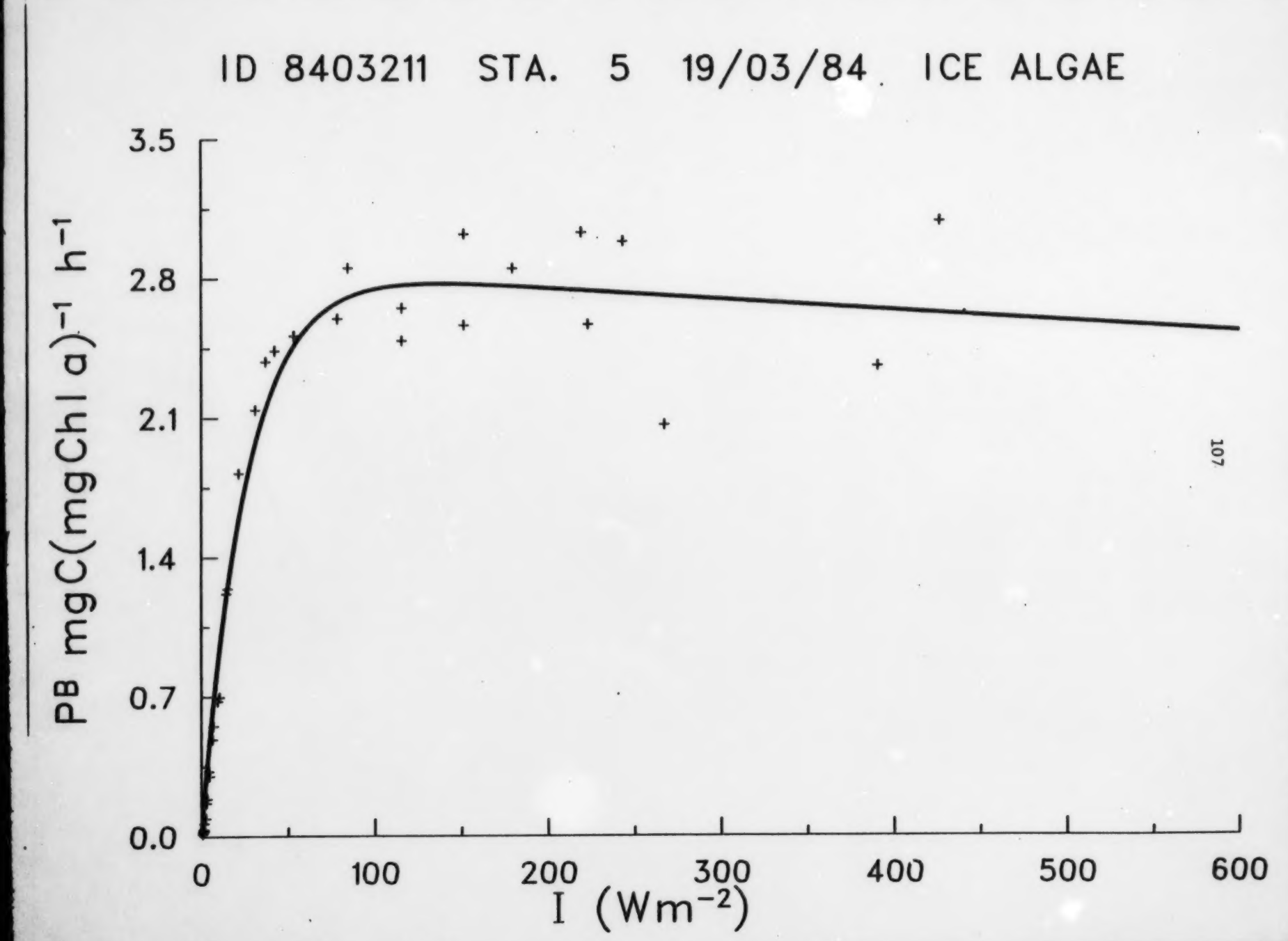

ID 8403204 STA. 2 17/03/84 25 M
PB mgC(mgChl a)$^{-1}$ h^{-1}
2.5
2.0
1.5
1.0
0.5
0.0
0
100
200
300
400
500
600
I (Wm^{-2})
102

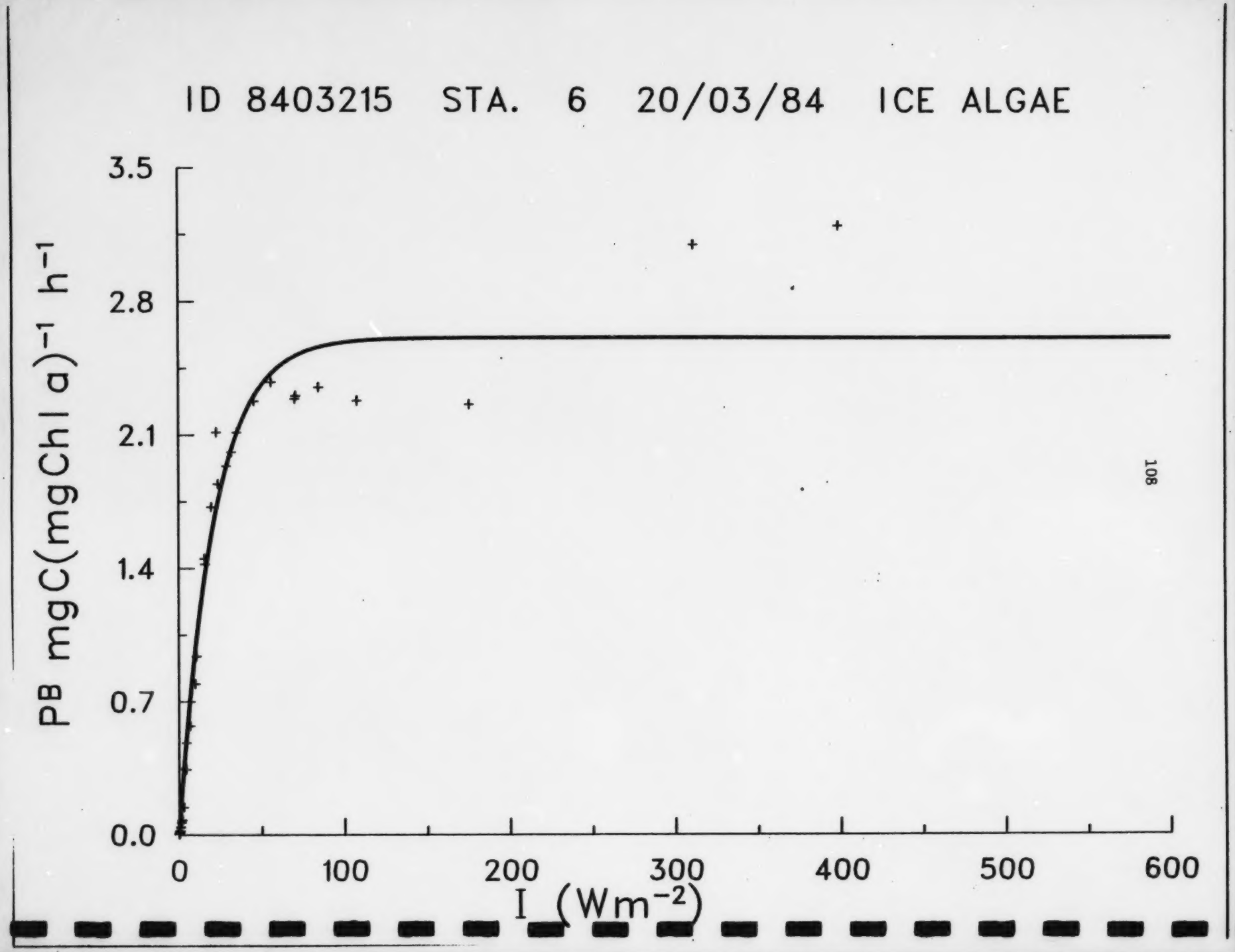

ID 8403205 STA. 3 17/03/84 ICE ALGAE
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
103

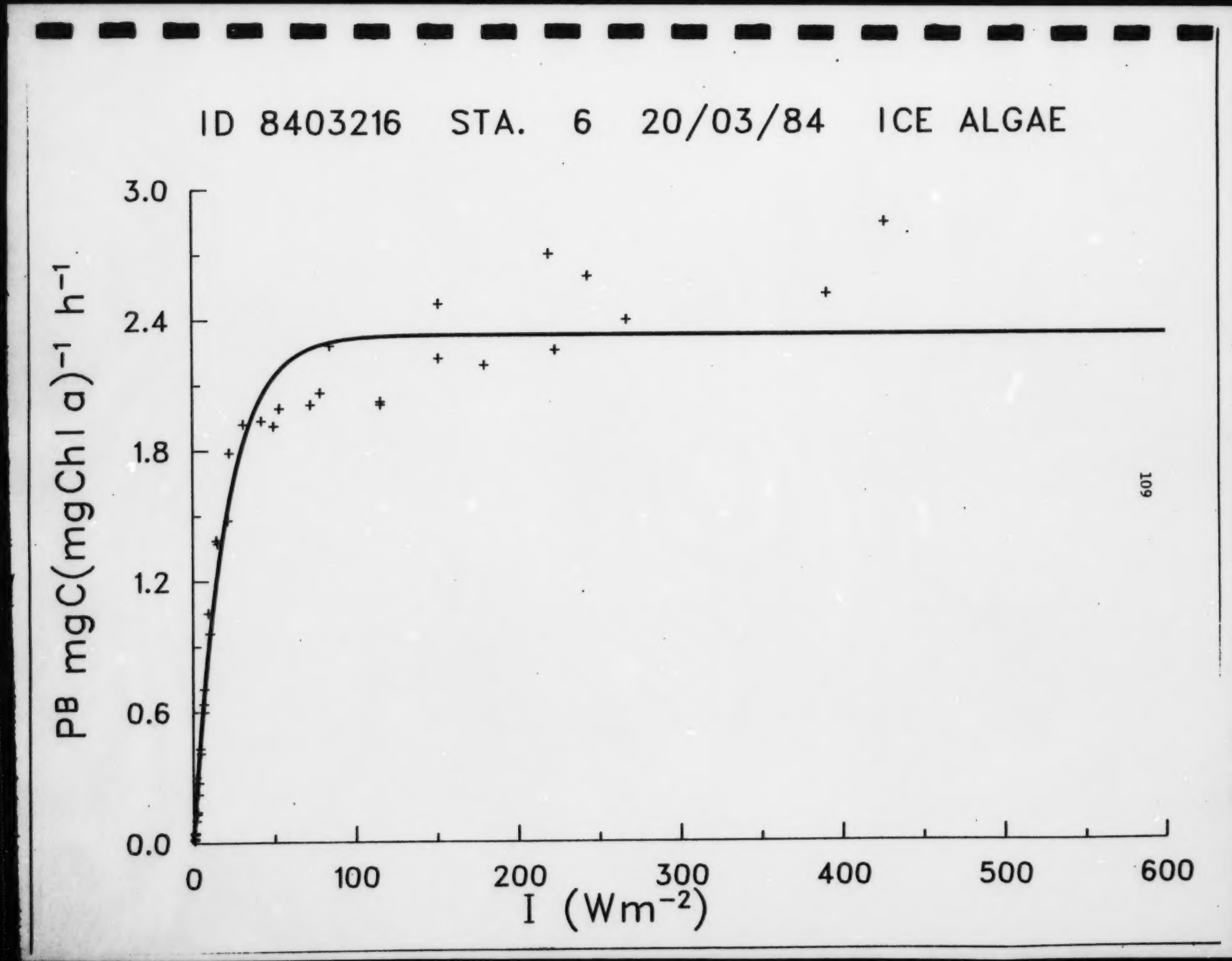

ID 8403206 STA. 4 18/03/84 5 M
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
104

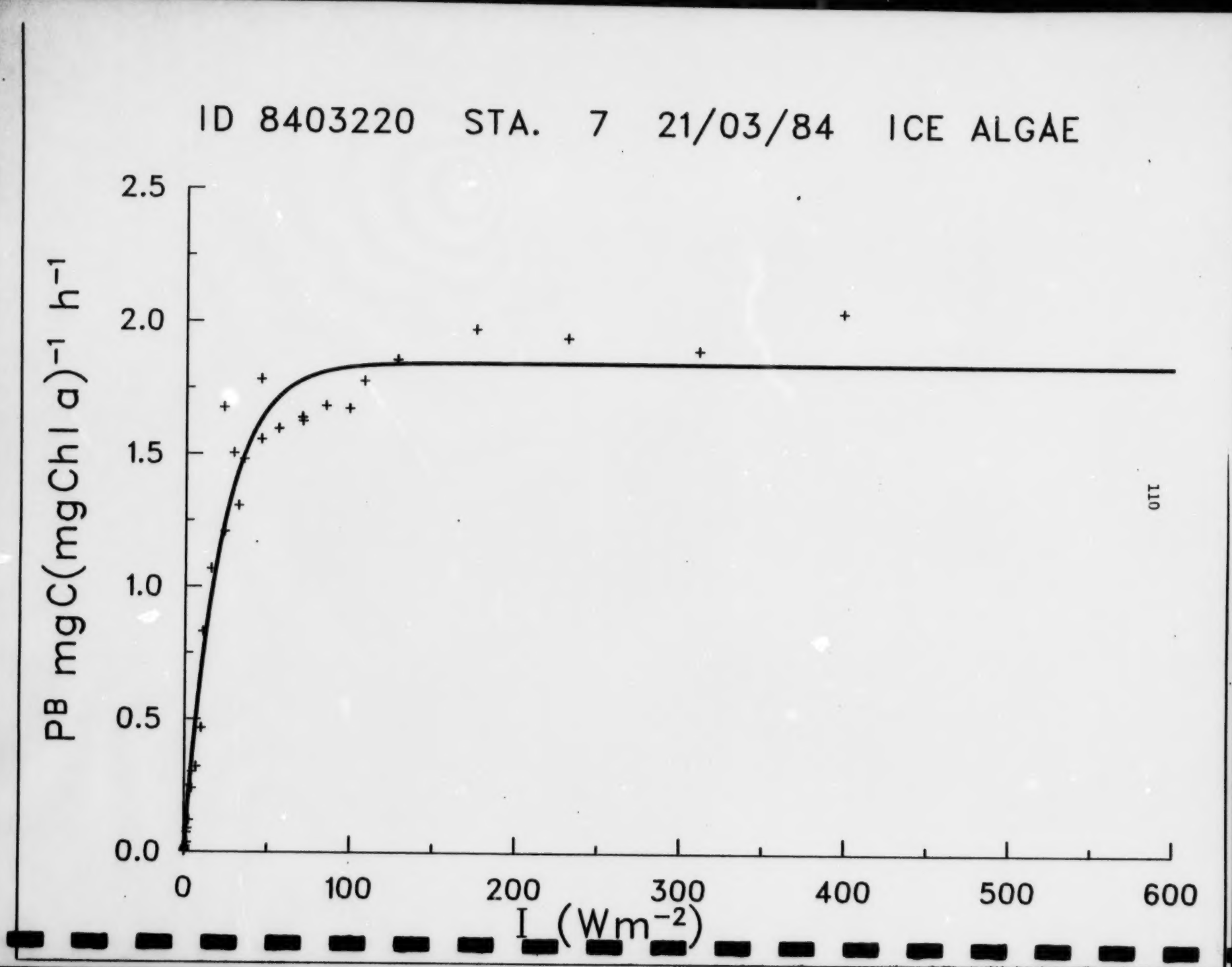

ID 8403207 STA. 4 18/03/84 5 M
PB mgC(mgChl a)$^{-1}$ h^{-1}
2.5
2.0
1.5
1.0
0.5
0.0
0
100
200
300
400
500
600
I (Wm^{-2})
105

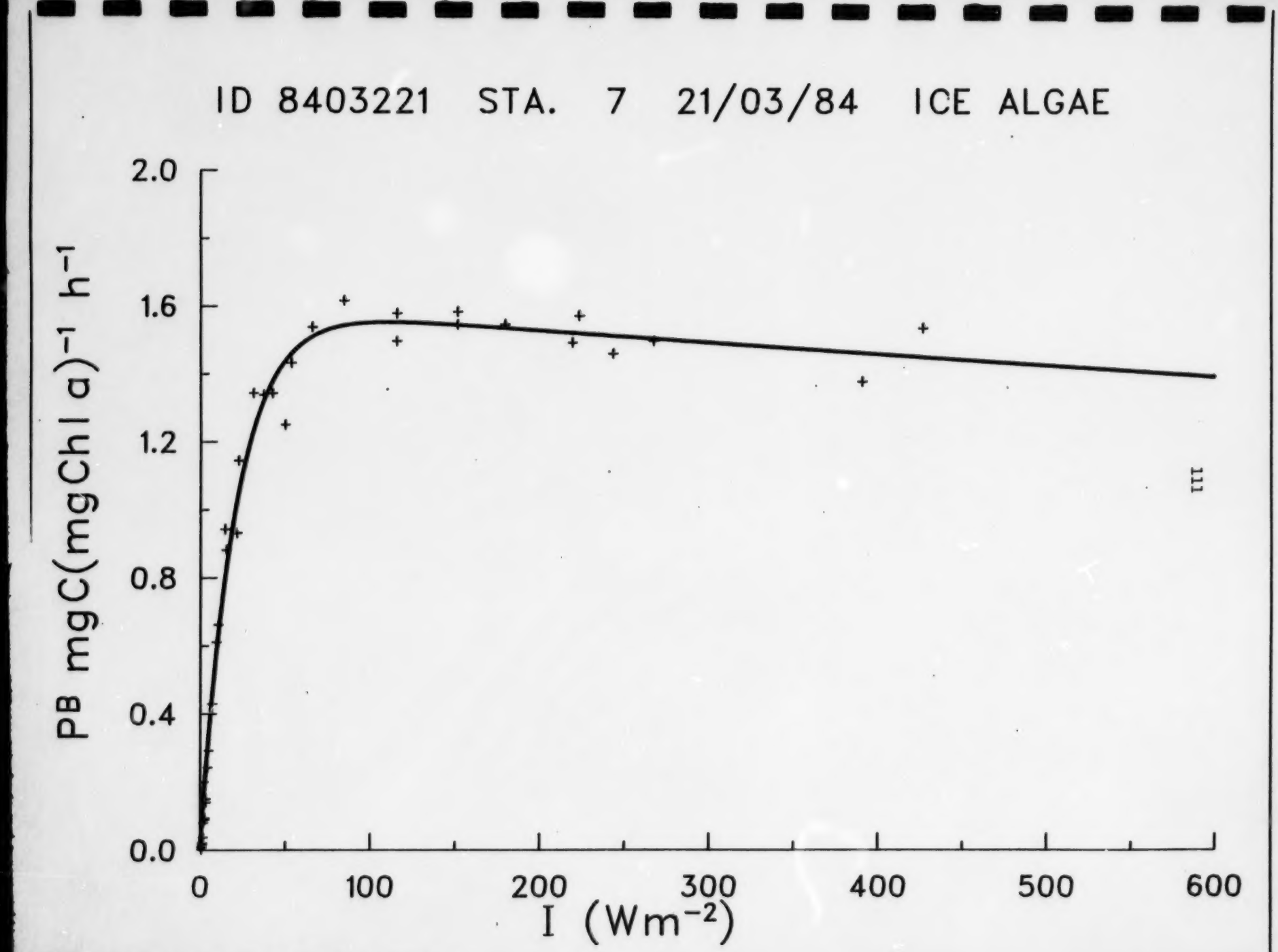

ID 8403210 STA. 5 19/03/84 ICE ALGAE
3.5
2.8
2.1
1.4
0.7
0.0
PB mgC(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
106

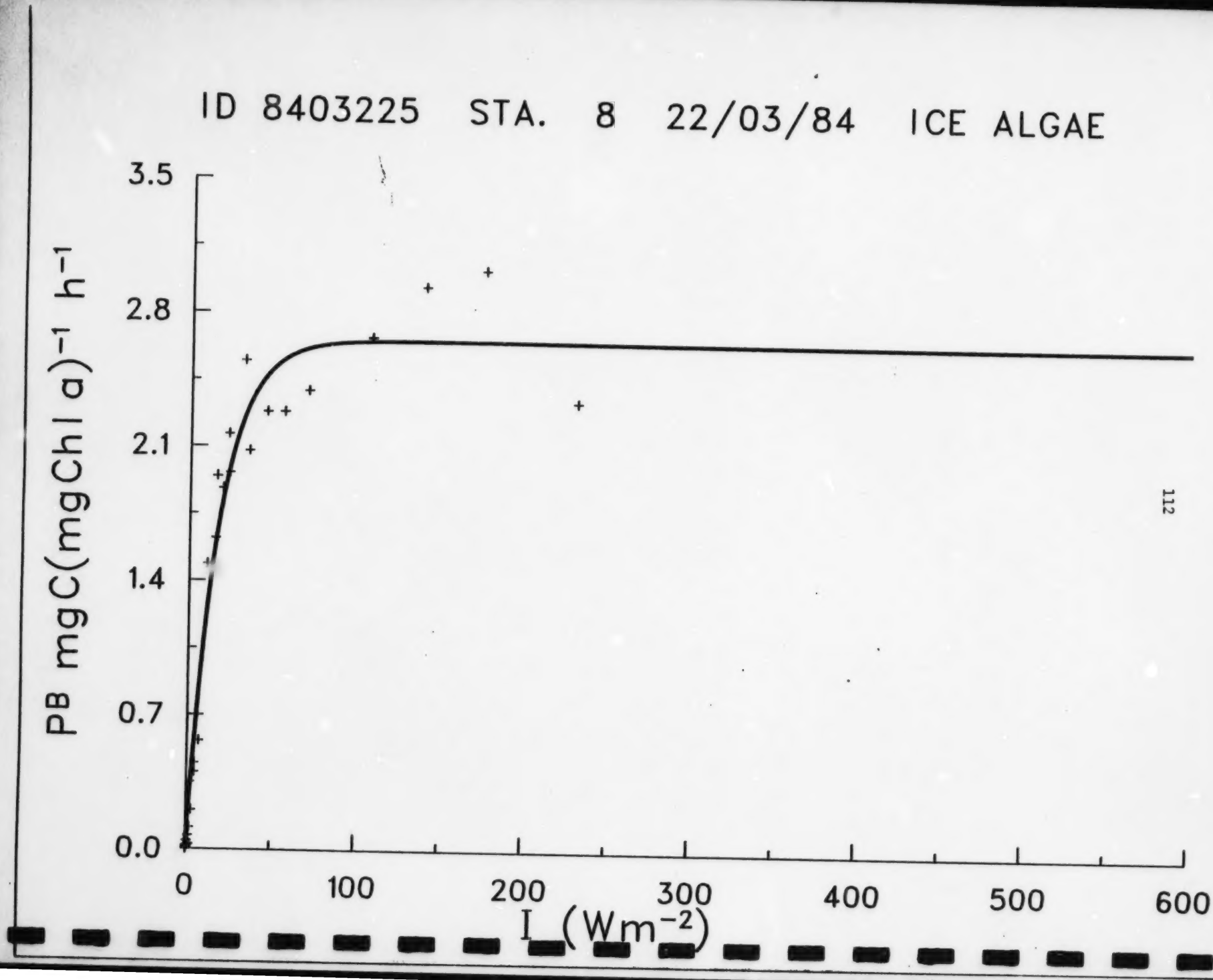

ID 8403211 STA. 5 19/03/84 ICE ALGAE
PB mgC(mgChl a)$^{-1}$ h^{-1}
3.5
2.8
2.1
1.4
0.7
0.0
0
100
200
300
400
500
600
I (Wm^{-2})
107

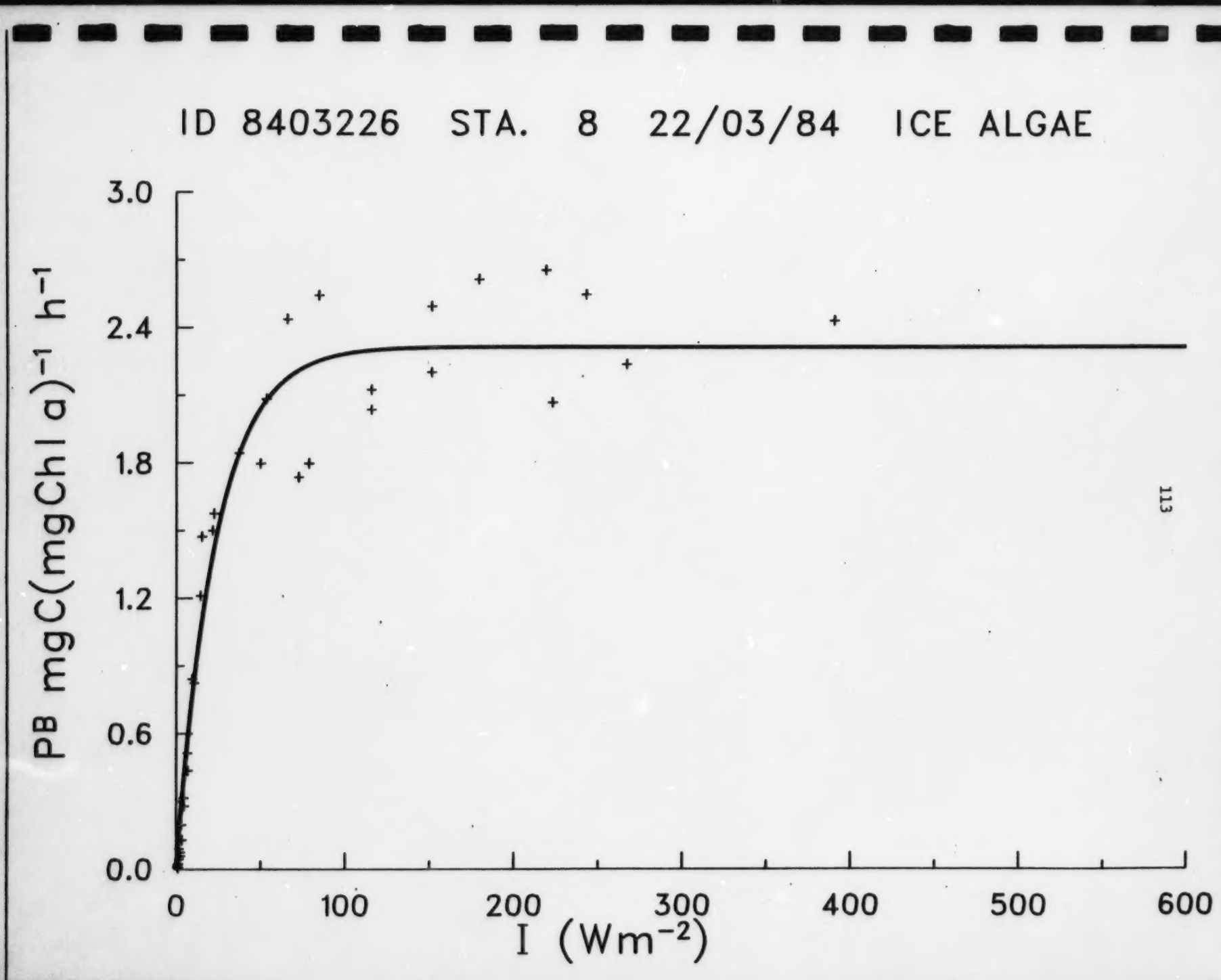

ID 8403215 STA. 6 20/03/84 ICE ALGAE
3.5
2.8
2.1
1.4
0.7
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
108

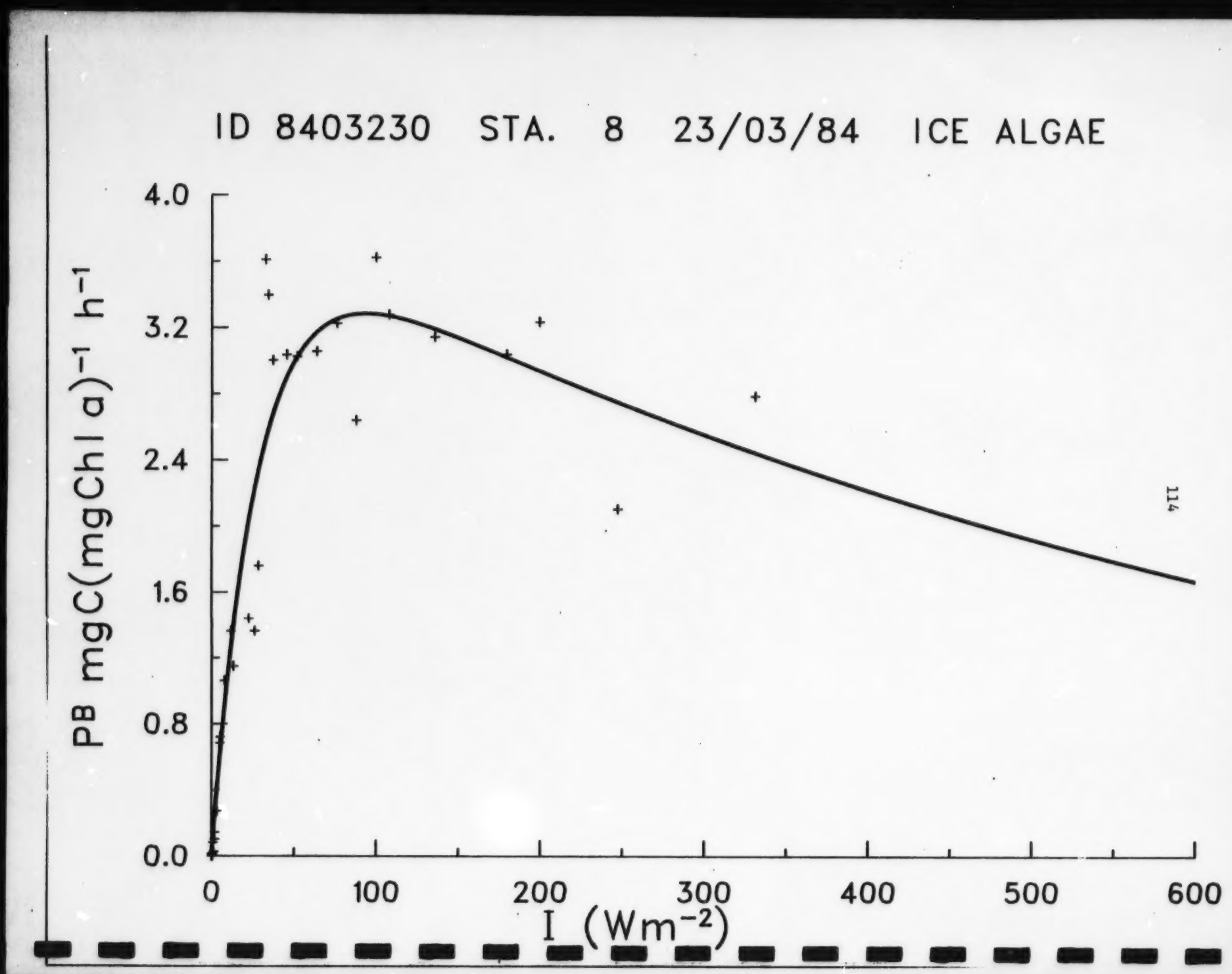

ID 8403216 STA. 6 20/03/84 ICE ALGAE
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
109

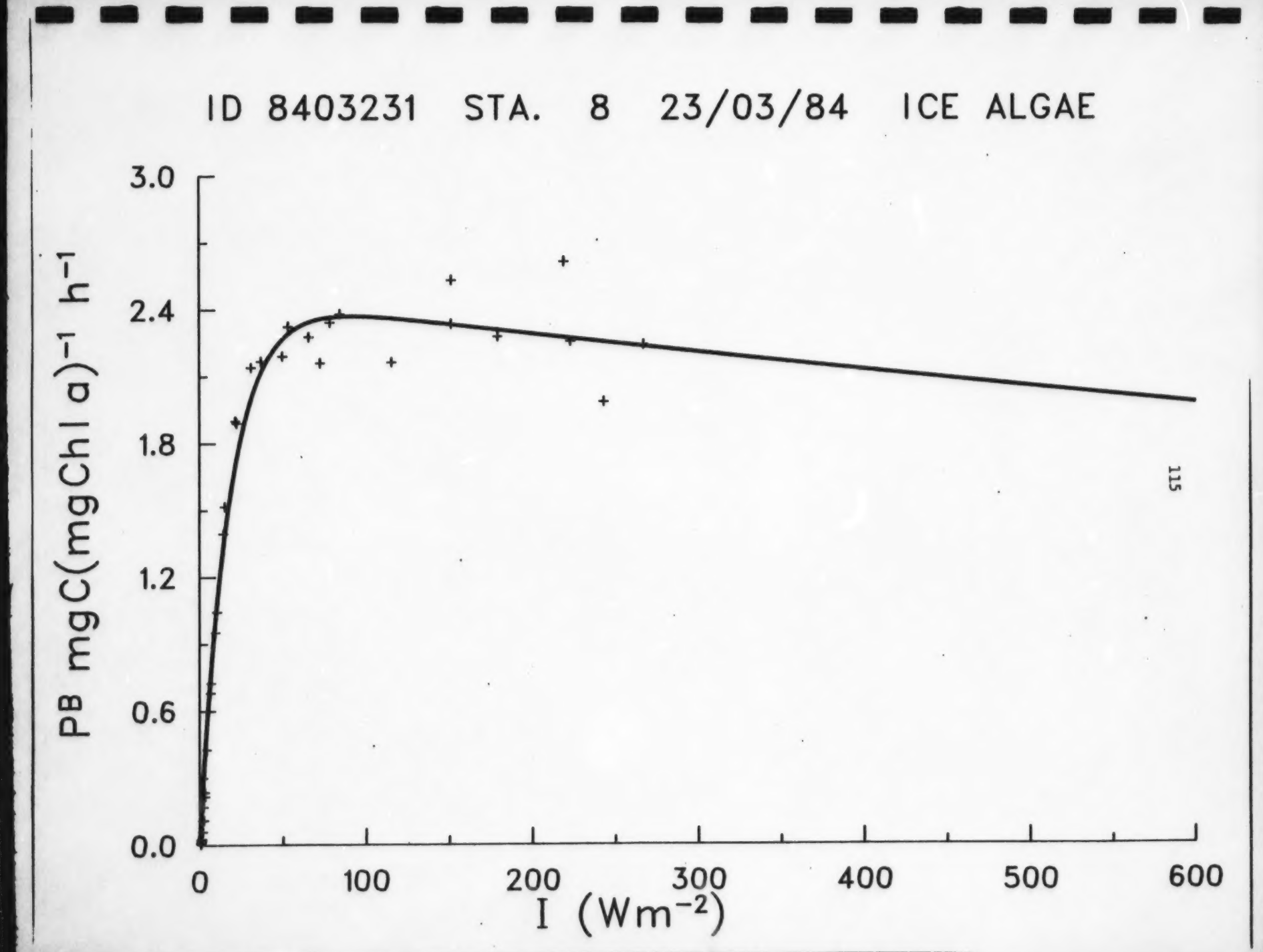

ID 8403220 STA. 7 21/03/84 ICE ALGAE
2.5
2.0
1.5
1.0
0.5
0.0
PB mgC(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
110

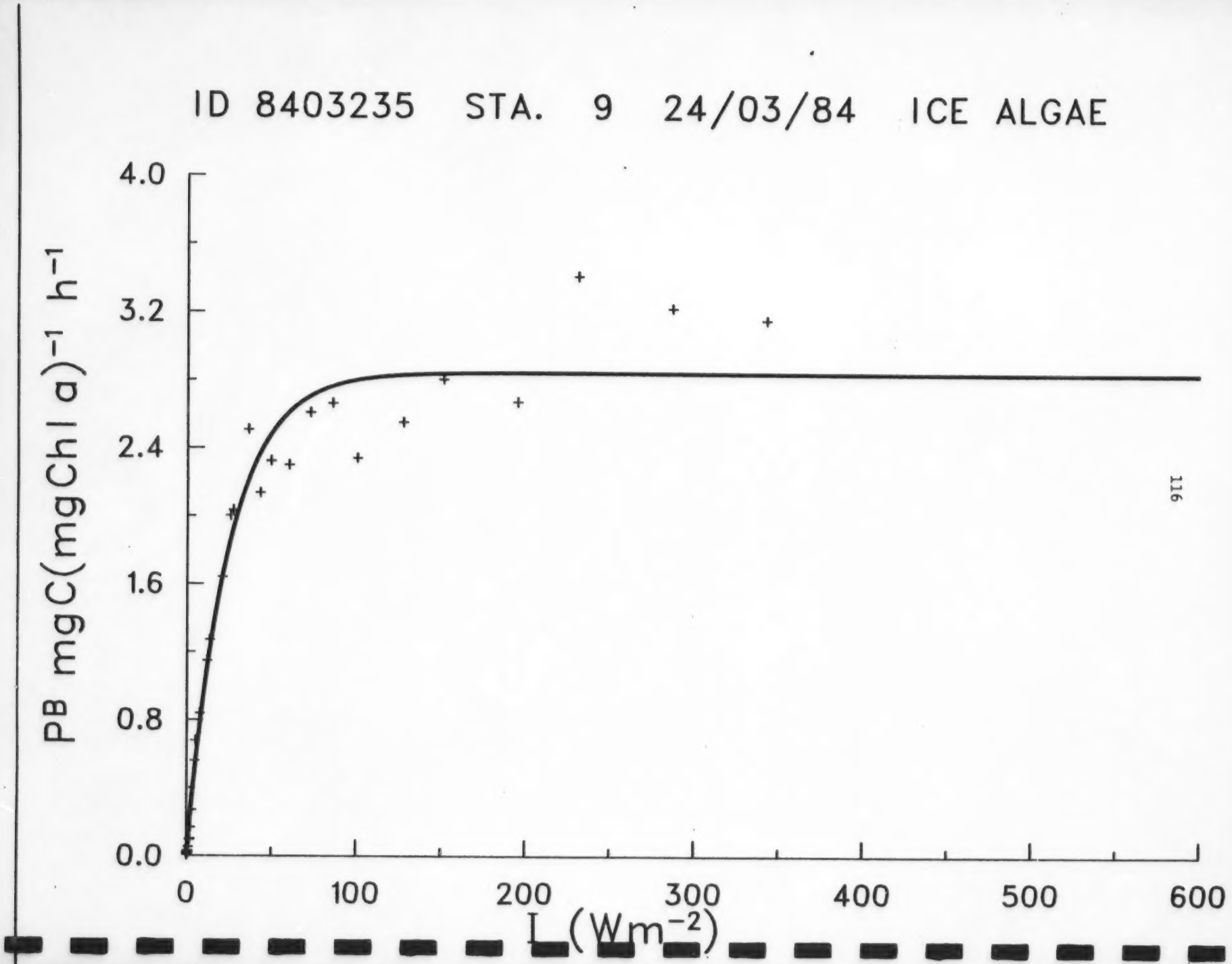

ID 8403221 STA. 7 21/03/84 ICE ALGAE
2.0
1.6
1.2
0.8
0.4
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
111

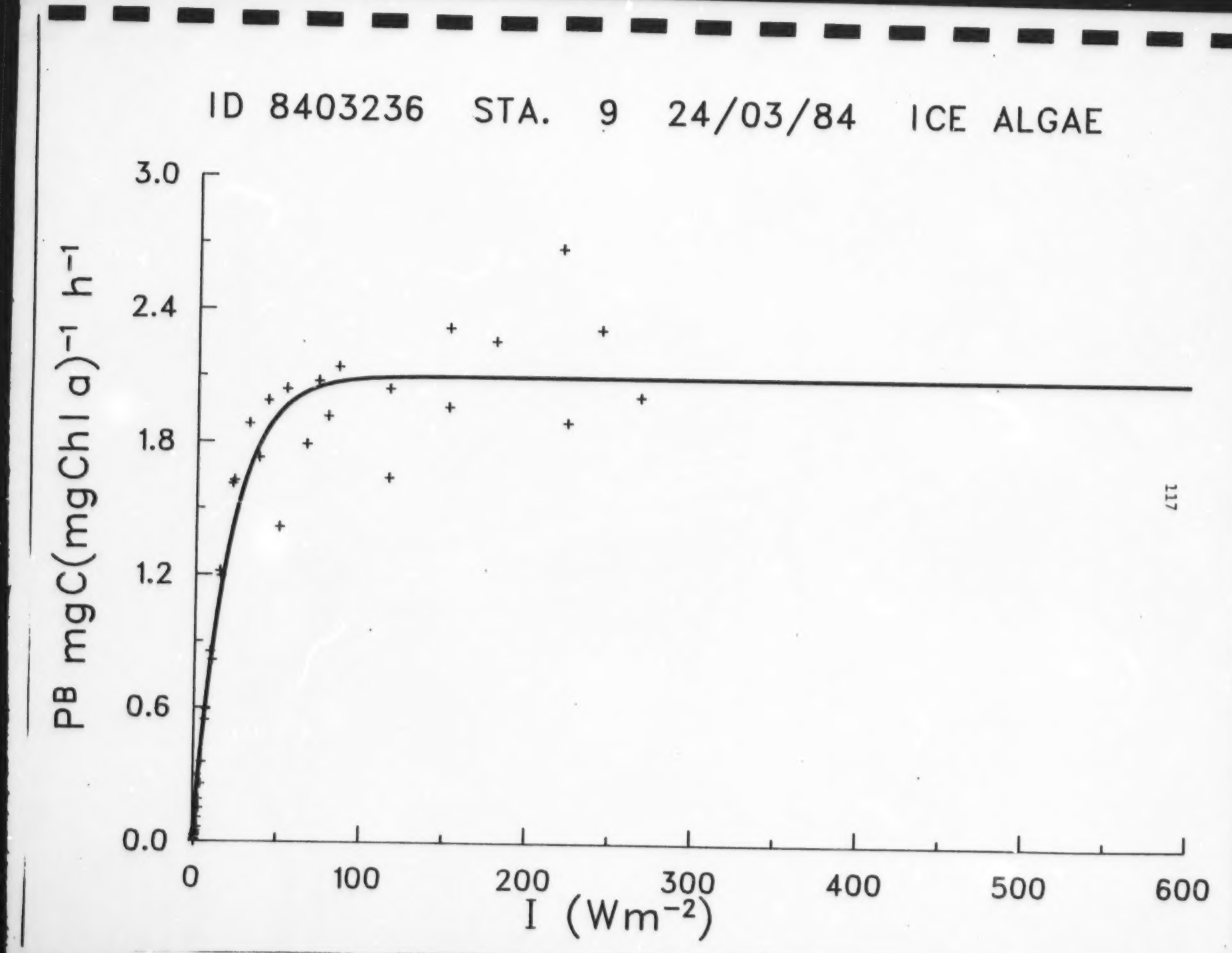

ID 8403225 STA. 8 22/03/84 ICE ALGAE
3.5
2.8
2.1
1.4
0.7
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})

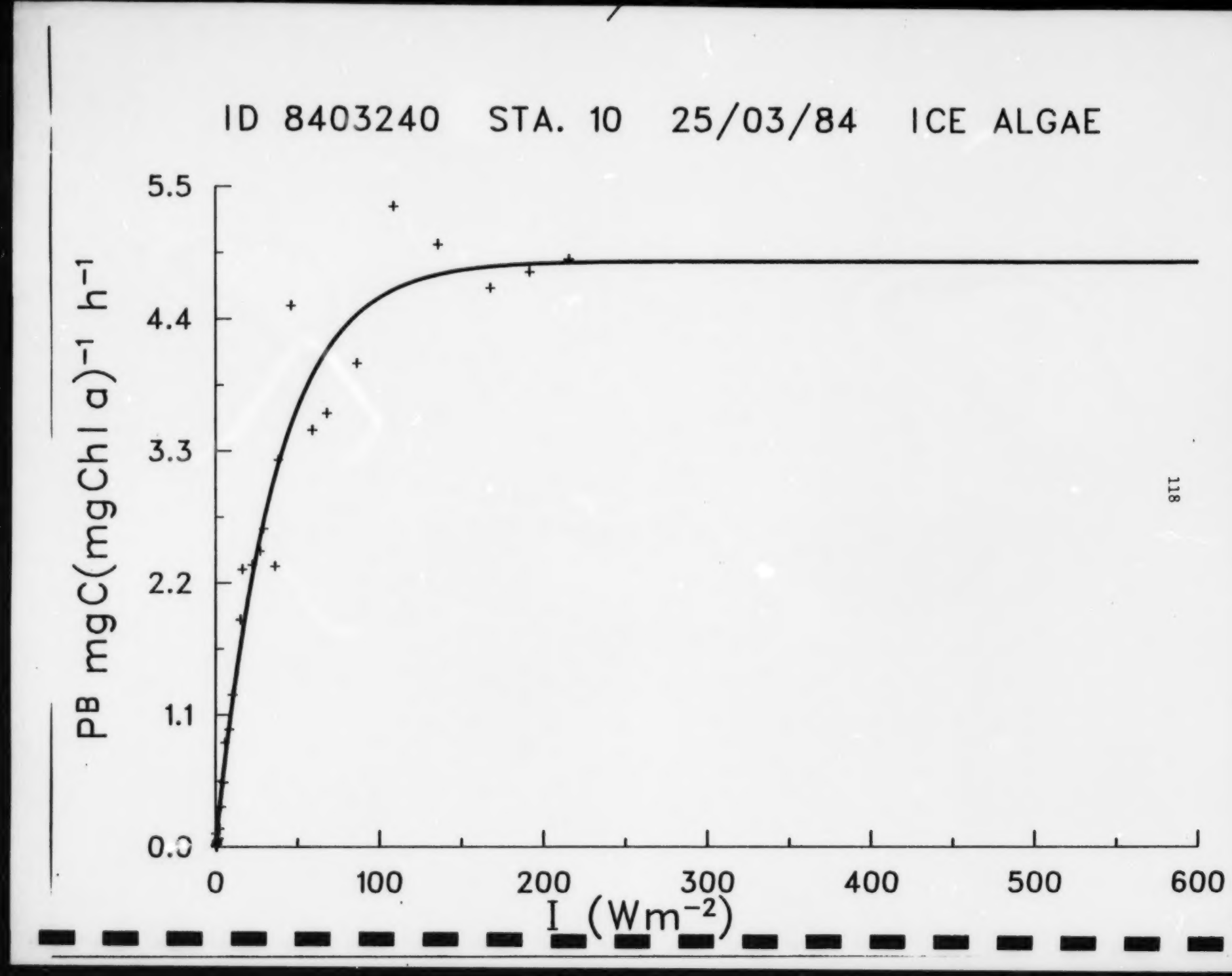

ID 8403226 STA. 8 22/03/84 ICE ALGAE
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)⁻¹ h⁻¹
0
100
200
300
400
500
600
I (Wm⁻²)
113

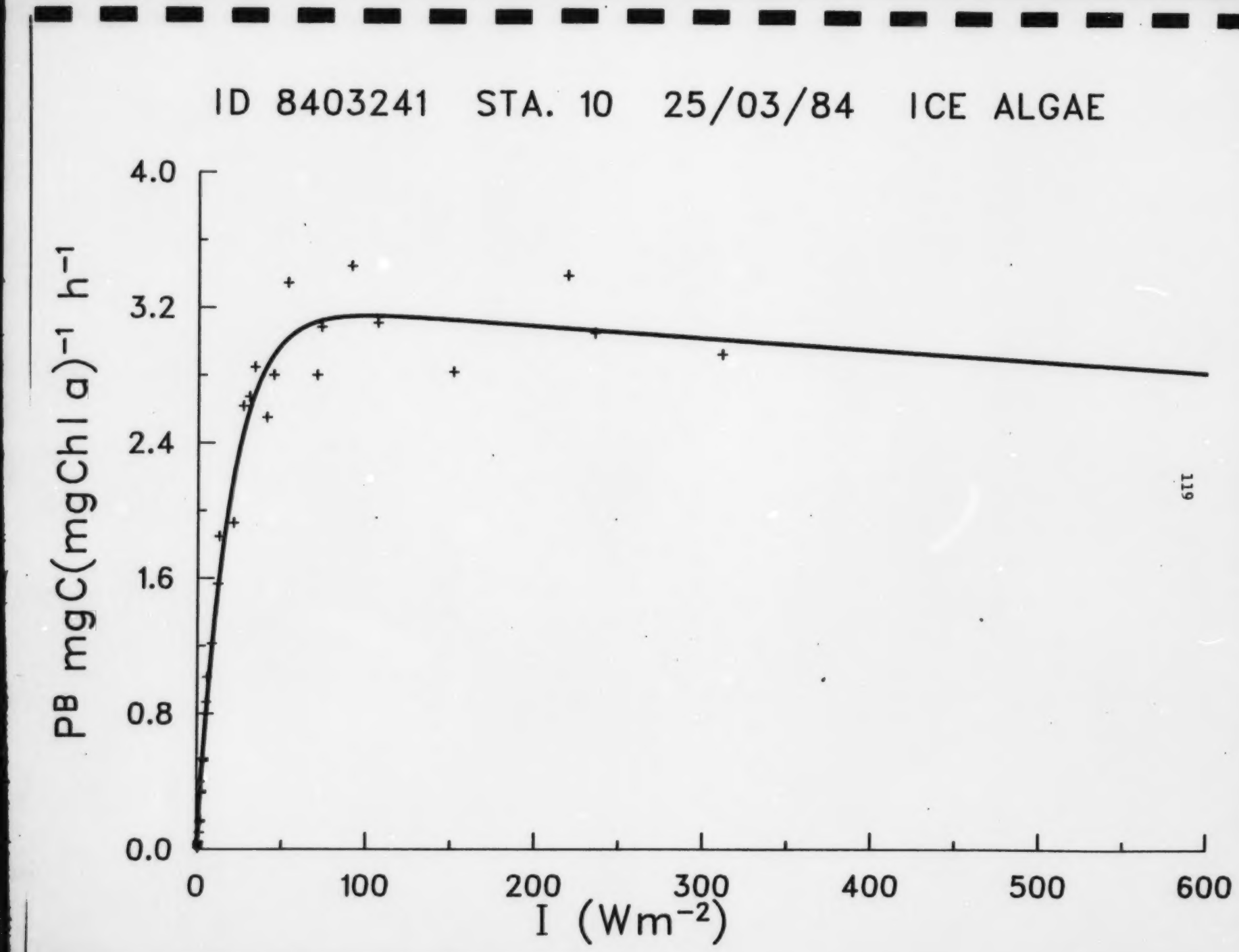

ID 8403230 STA. 8 23/03/84 ICE ALGAE
4.0
3.2
2.4
1.6
0.8
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
114

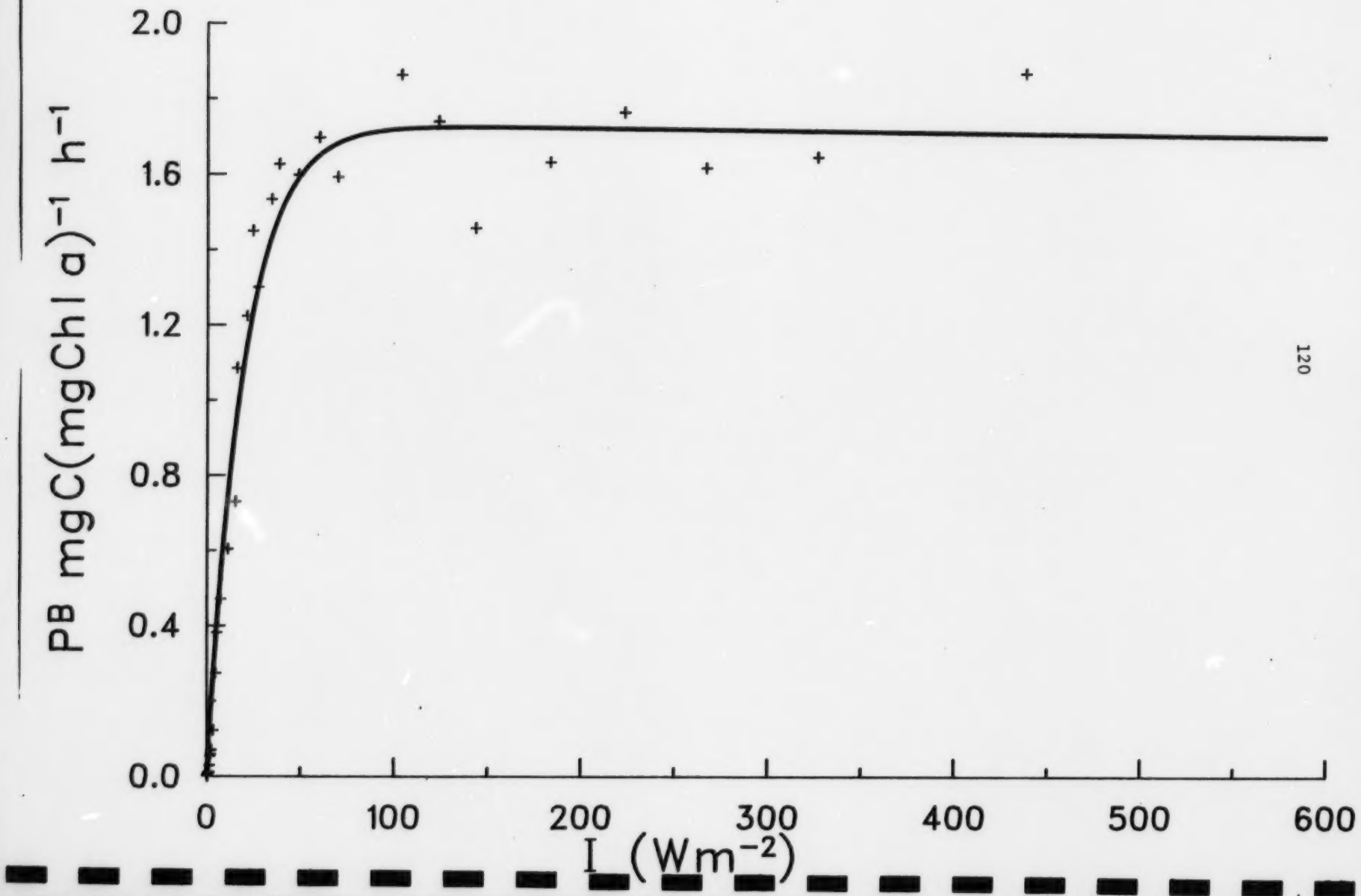

ID 8403231 STA. 8 23/03/84 ICE ALGAE
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})

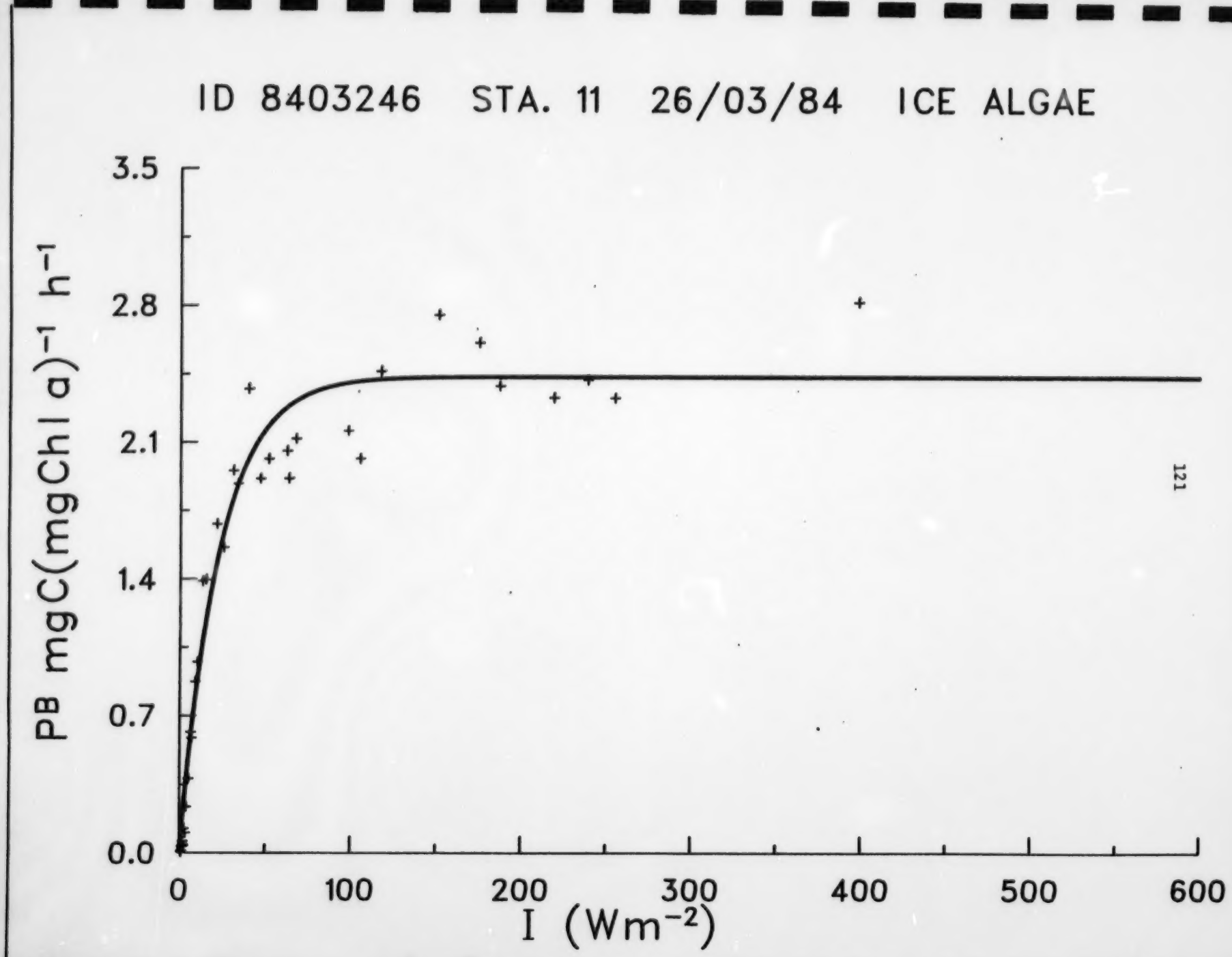

ID 8403235 STA. 9 24/03/84 ICE ALGAE
4.0
3.2
2.4
1.6
0.8
0.0
PB mgC(mgChl a)⁻¹ h⁻¹
0
100
200
300
400
500
600
I (Wm⁻²)

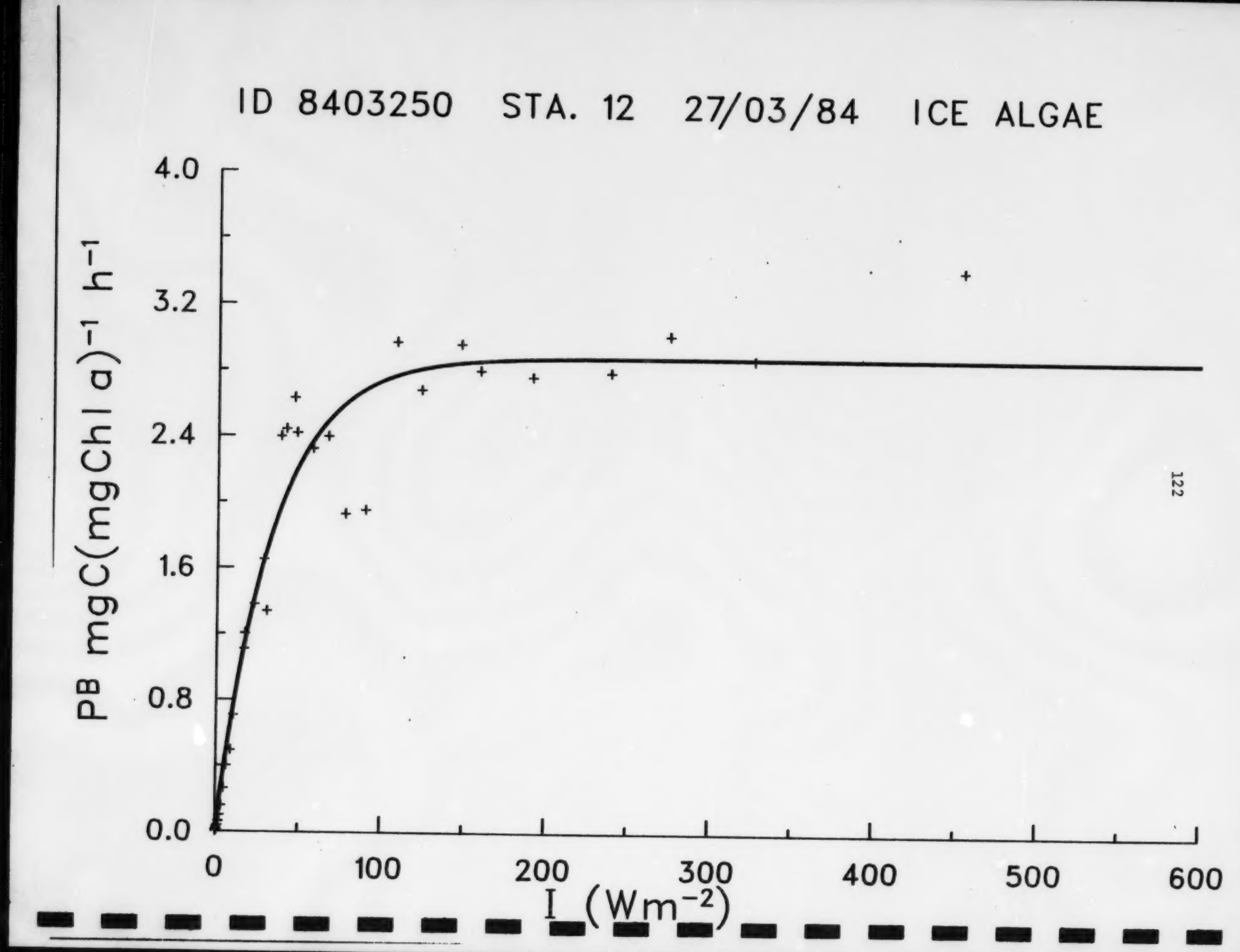

ID 8403236 STA. 9 24/03/84 ICE ALGAE
3.0
2.4
1.8
1.2
0.6
0.0
PB mgC(mgChl a)⁻¹ h⁻¹
0
100
200
300
400
500
600
I (Wm⁻²)
117

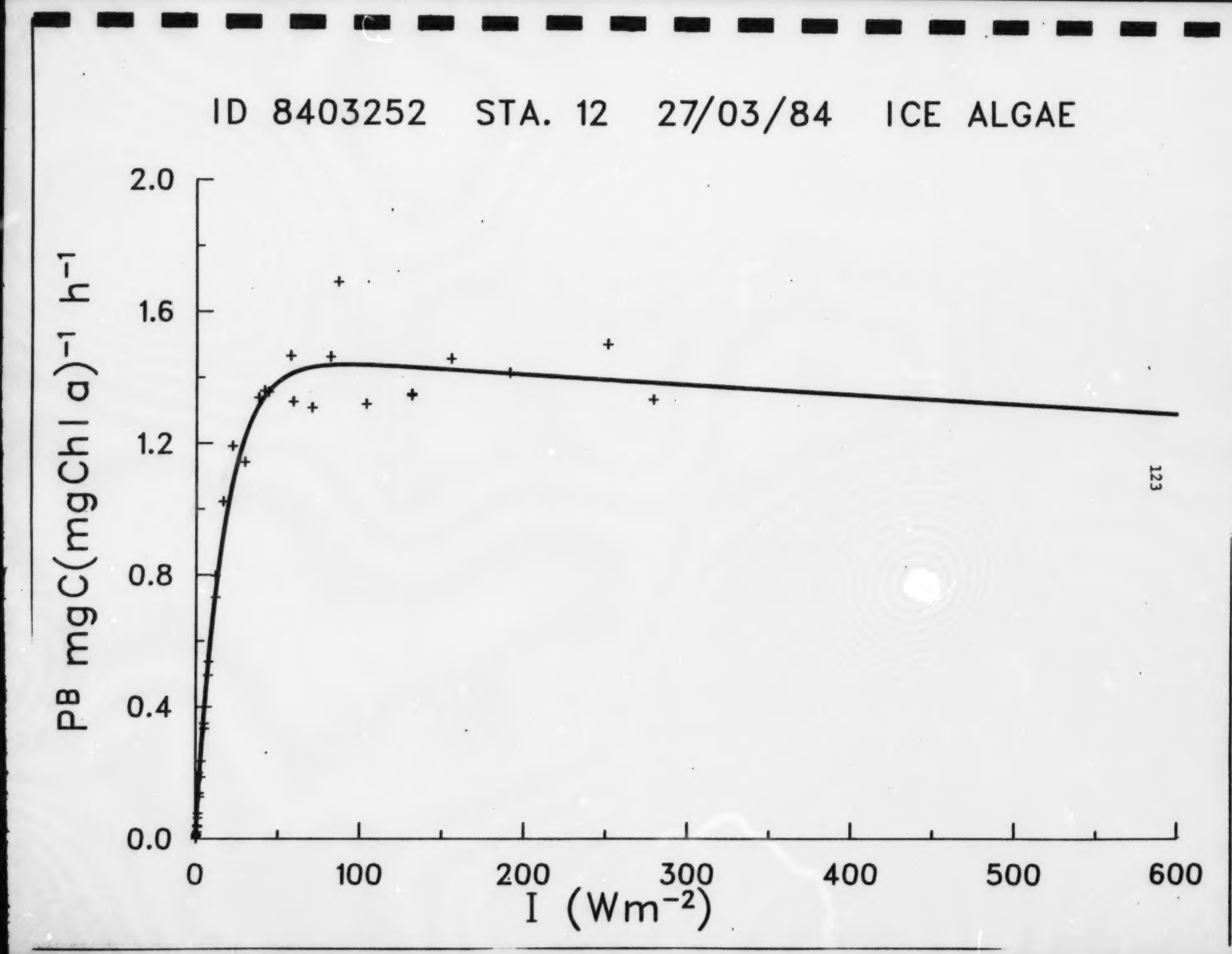

ID 8403240 STA. 10 25/03/84 ICE ALGAE
5.5
4.4
3.3
2.2
1.1
0.0
PB mgC(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
118


ID 8403241 STA. 10 25/03/84 ICE ALGAE
PB mgC(mgChl a)$^{-1}$ h^{-1}
4.0
3.2
2.4
1.6
0.8
0.0
0
100
200
300
400
500
600
I (Wm^{-2})
119

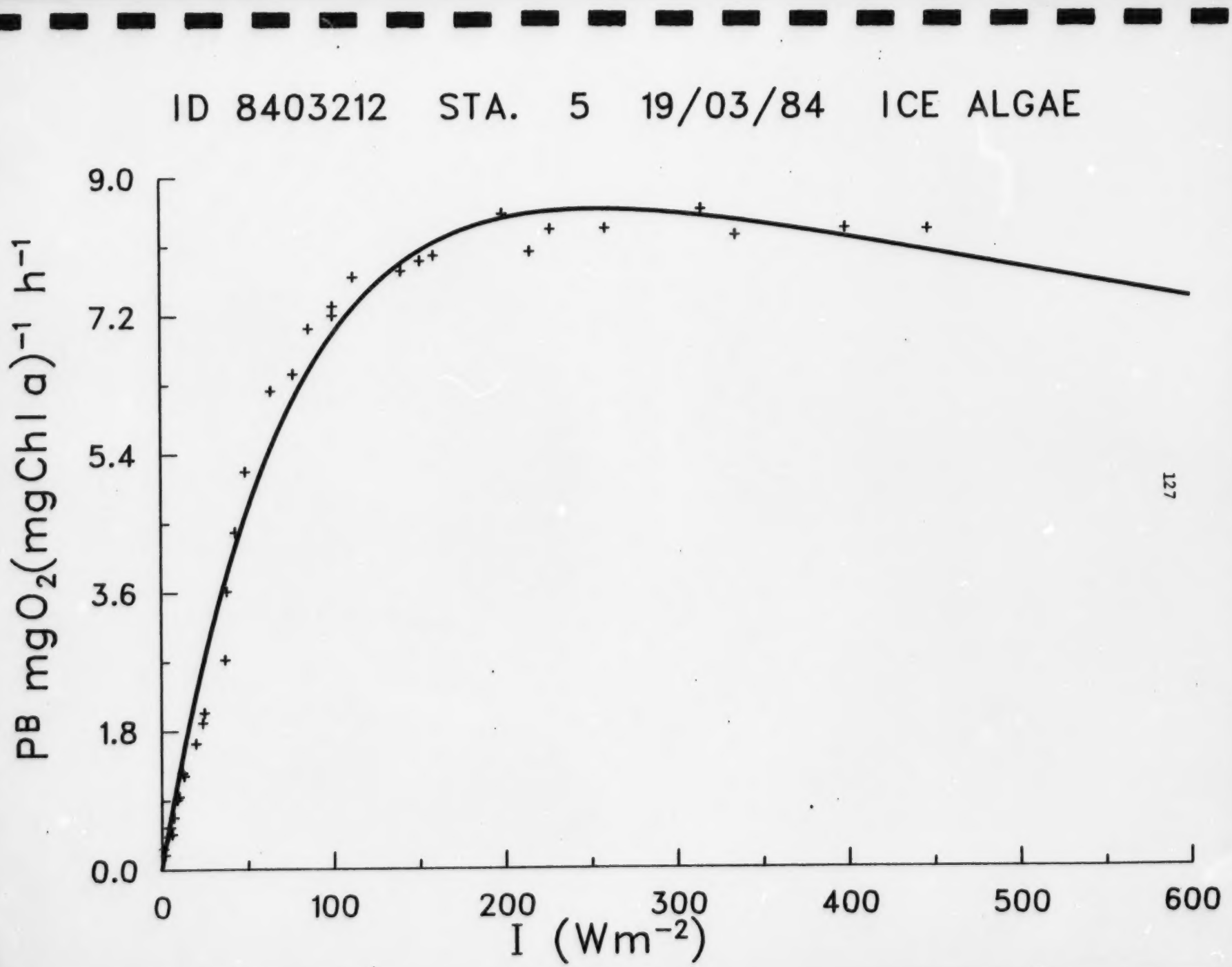

ID 8403245 STA. 11 26/03/84 ICE ALGAE
PB mgC(mgChl a)$^{-1}$ h^{-1}
2.0
1.6
1.2
0.8
0.4
0.0
0
100
200
300
400
500
600
I (Wm^{-2})
120

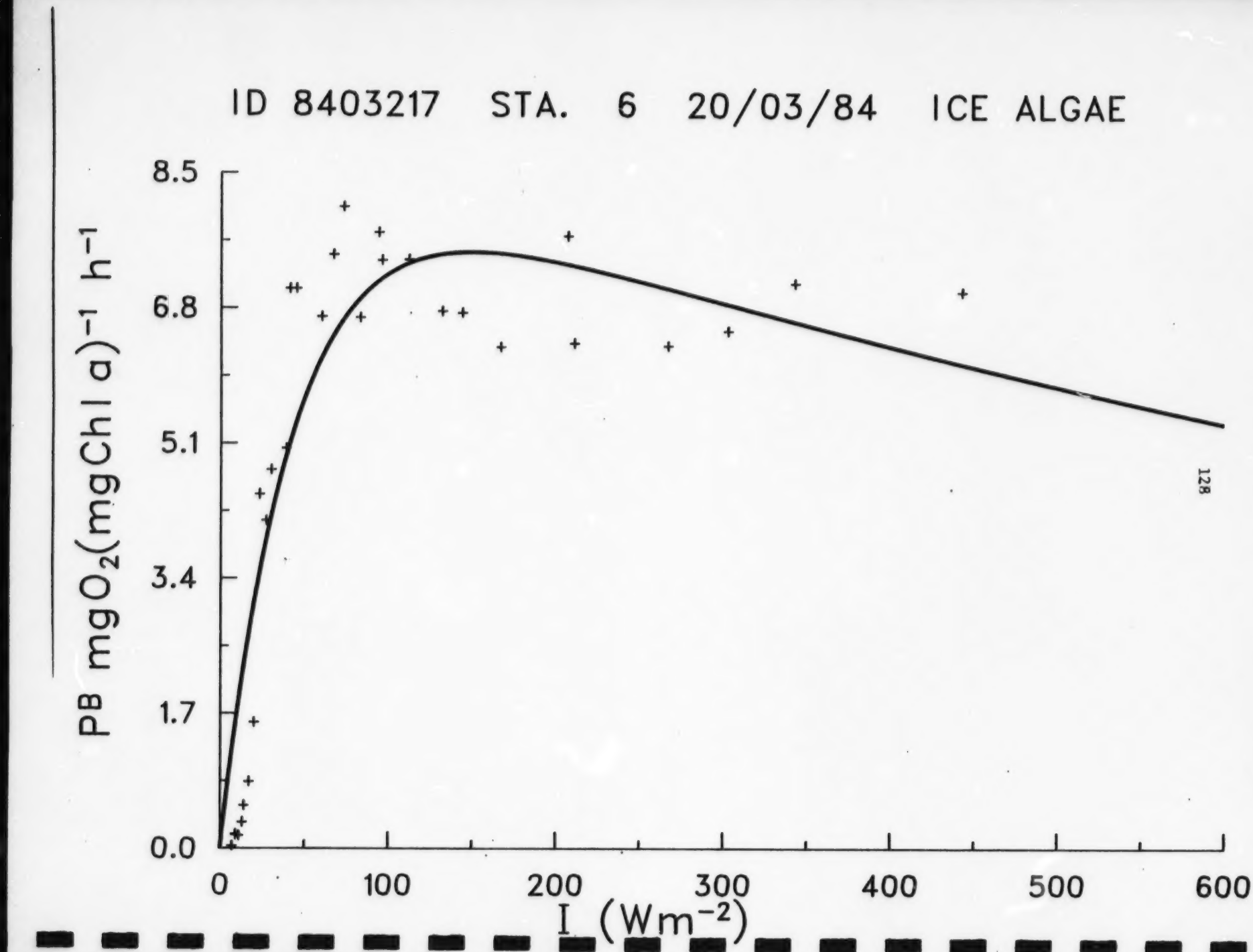

ID 8403246 STA. 11 26/03/84 ICE ALGAE
3.5
2.8
2.1
1.4
0.7
0.0
PB mgC(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
121

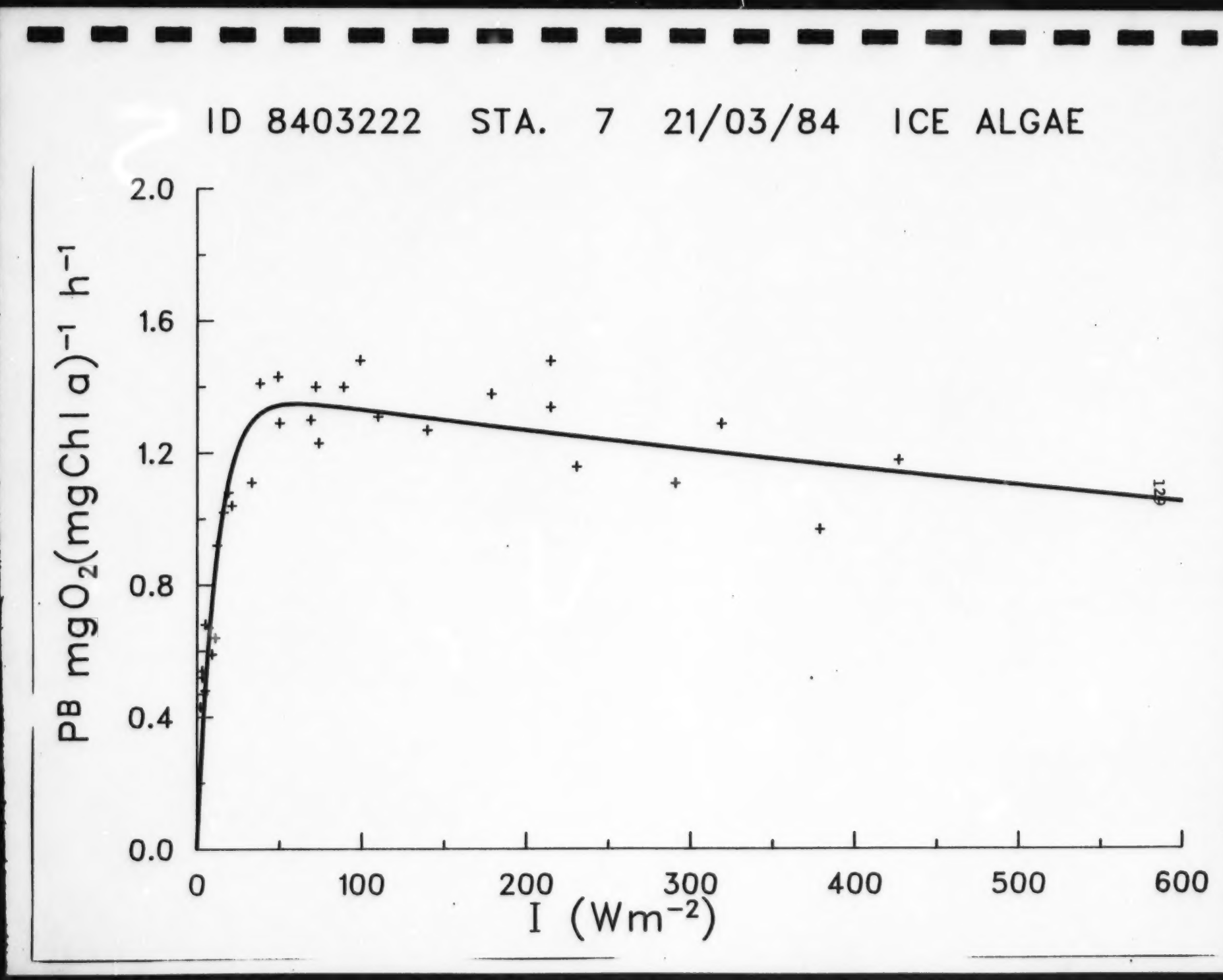

ID 8403250 STA. 12 27/03/84 ICE ALGAE
4.0
3.2
2.4
1.6
0.8
0.0
PB mgC(mgChl a)$^{-1}$ h^{-1}
0
100
200
300
400
500
600
I (Wm^{-2})
122

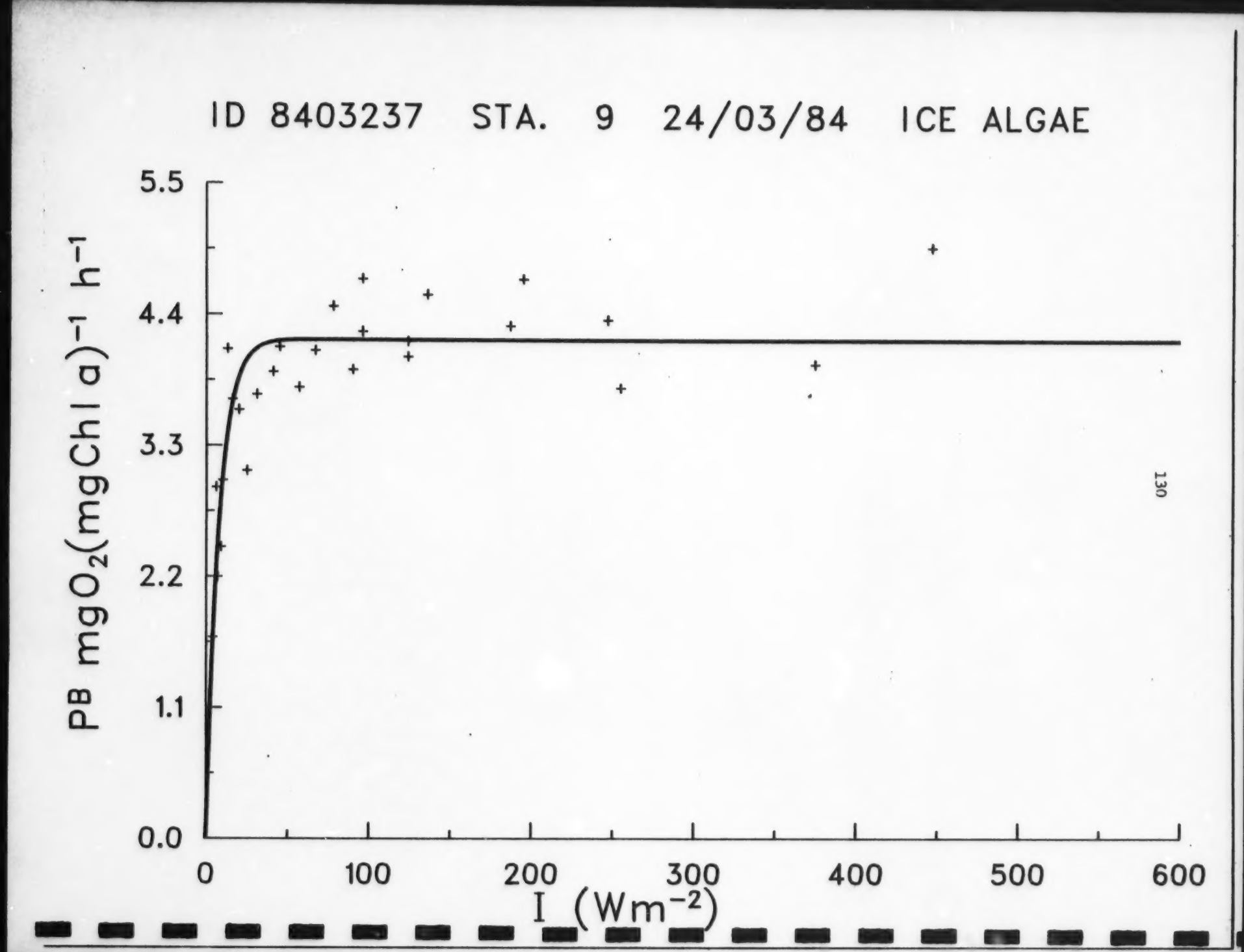

ID 8403252 STA. 12 27/03/84 ICE ALGAE
2.0
1.6
1.2
0.8
0.4
0.0
PB mgC(mgChl a)⁻¹ h⁻¹
0
100
200
300
400
500
600
I (Wm⁻²)
123

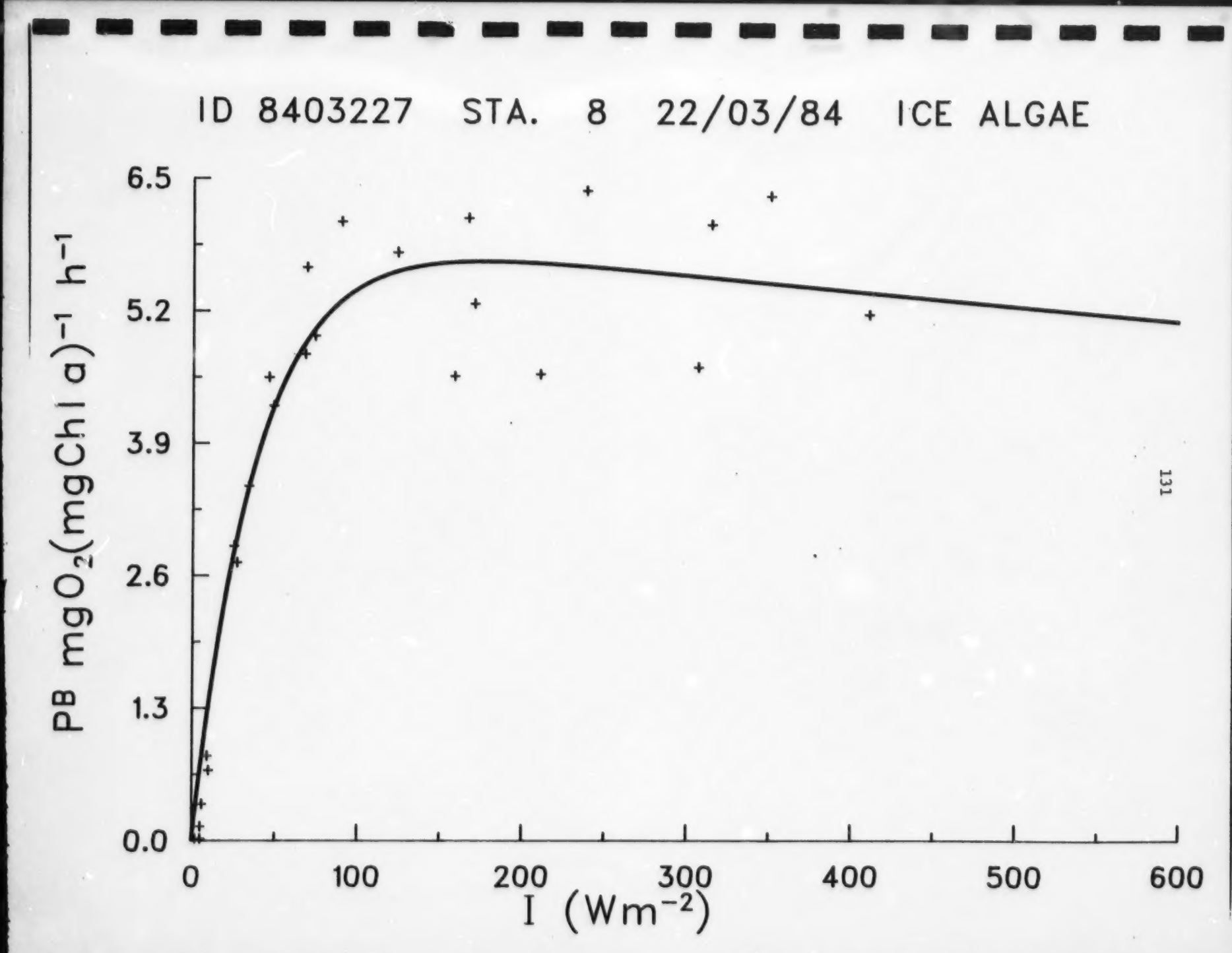
Solid line fit to observed oxygen PI data

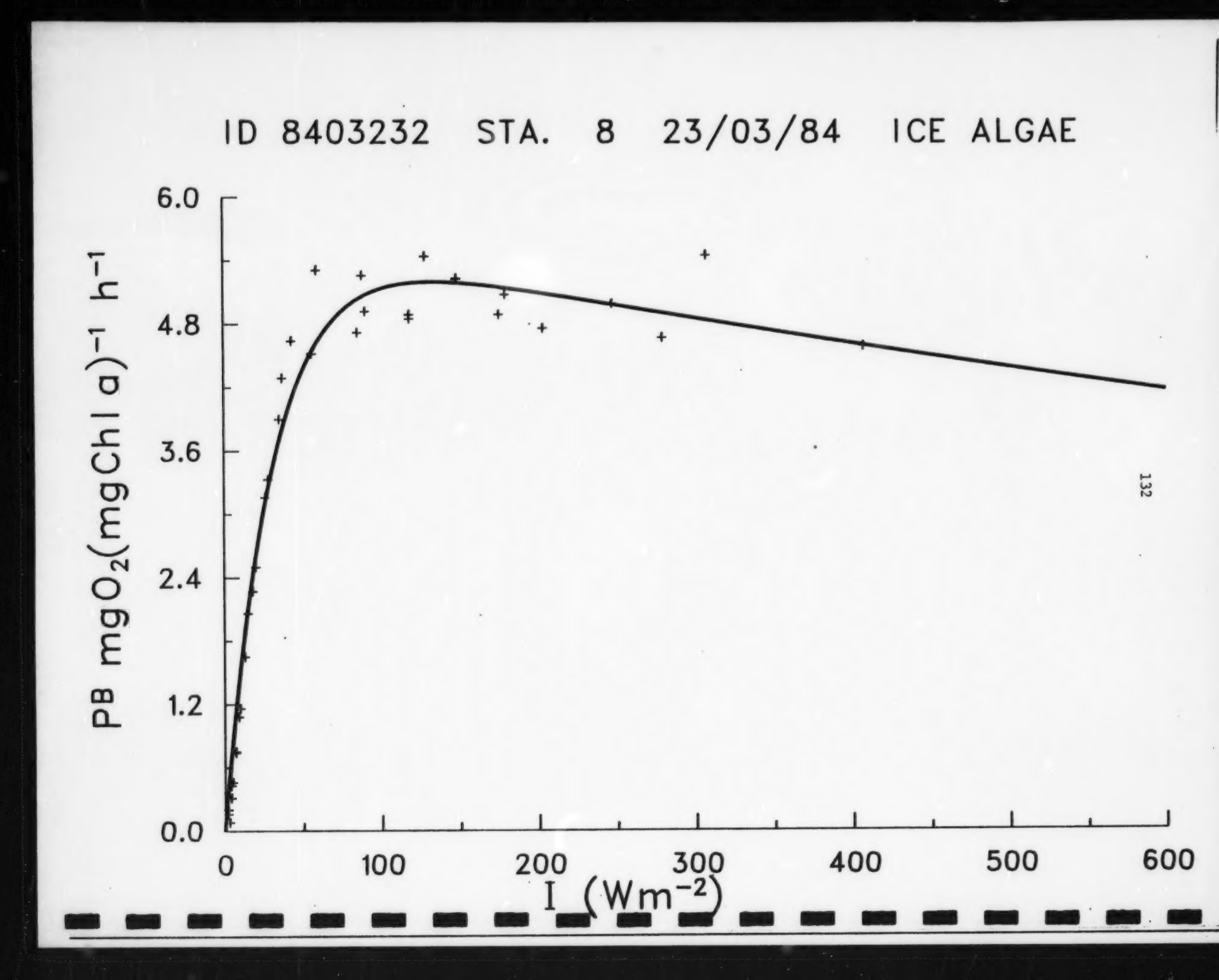

ID 8403212 STA. 5 19/03/84 ICE ALGAE
PB mgO2(mgChl a)-1 h-1
9.0
7.2
5.4
3.6
1.8
0.0
0
100
200
300
400
500
600
I (Wm-2)

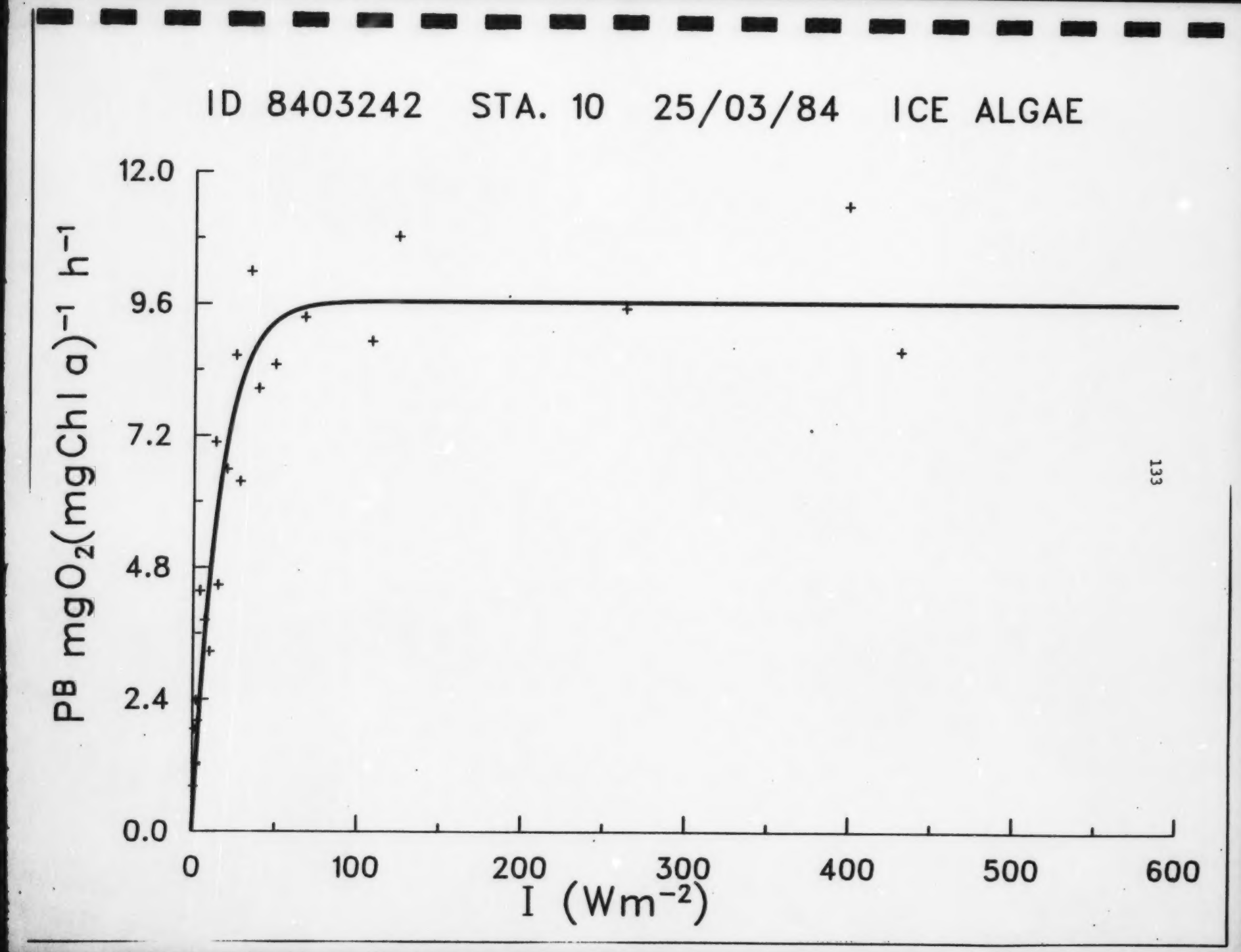

ID 8403217 STA. 6 20/03/84 ICE ALGAE
8.5
6.8
5.1
3.4
1.7
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
128

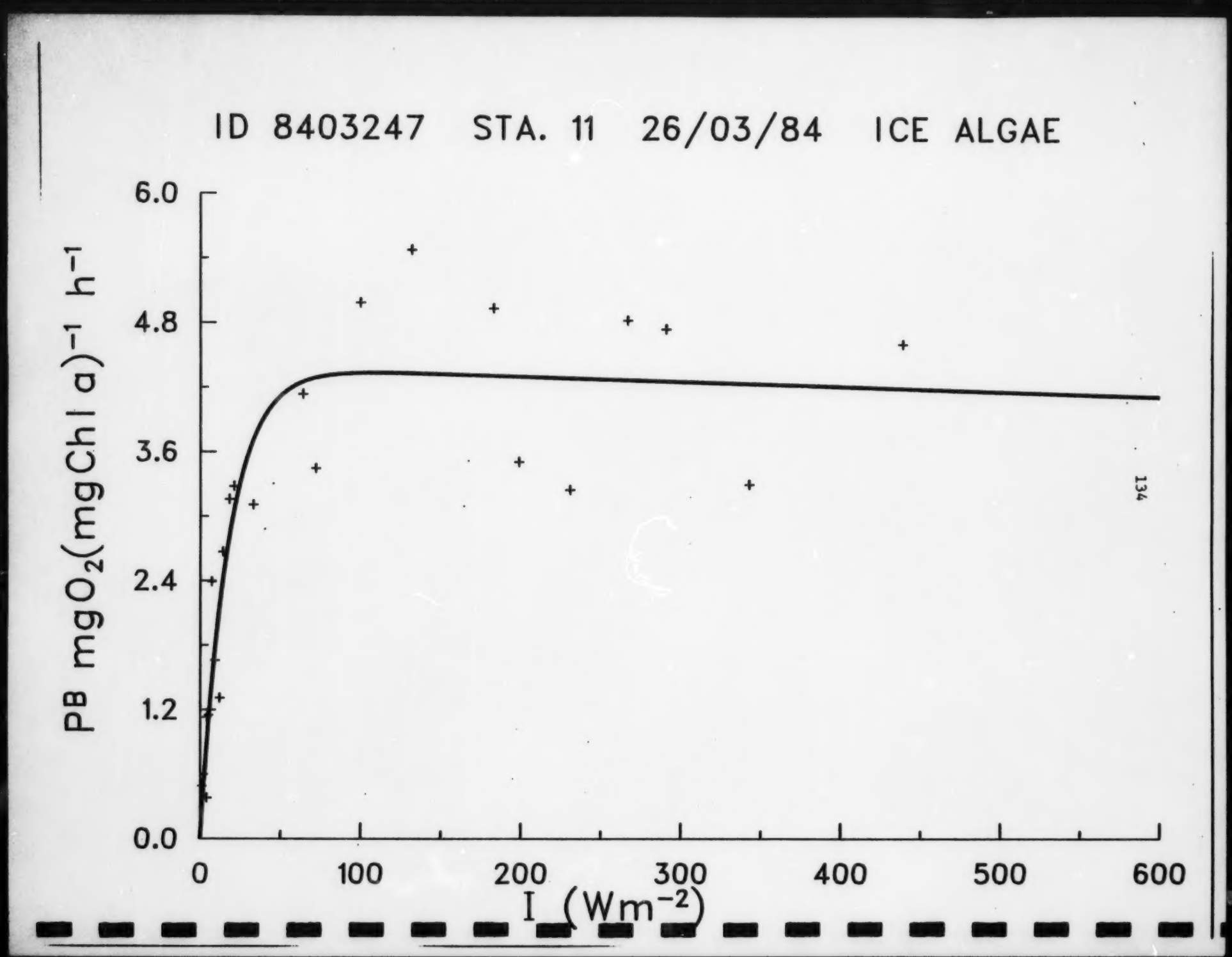

ID 8403222 STA. 7 21/03/84 ICE ALGAE
PB mgO2(mgChl a)-1 h-1
2.0
1.6
1.2
0.8
0.4
0.0
0
100
200
300
400
500
600
I (Wm-2)
129


ID 8403237 STA. 9 24/03/84 ICE ALGAE
5.5
4.4
3.3
2.2
1.1
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
130


ID 8403227 STA. 8 22/03/84 ICE ALGAE
6.5
5.2
3.9
2.6
1.3
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)


ID 8403232 STA. 8 23/03/84 ICE ALGAE
6.0
4.8
3.6
2.4
1.2
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
132


ID 8403242 STA. 10 25/03/84 ICE ALGAE
12.0
9.6
7.2
4.8
2.4
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
133


ID 8403247 STA. 11 26/03/84 ICE ALGAE
6.0
4.8
3.6
2.4
1.2
0.0
PB mgO2(mgChl a)-1 h-1
0
100
200
300
400
500
600
I (Wm-2)
134

Total Radiation

Totals are W m^{-2} for each hour ending at hour indicated. All times are A.S.T.

TOTAL RADIATION
ICE ALGAE - BAFFIN 1984

TIME	16/3	17/3	18/3	19/3	20/3	21/3	22/3	23/3
0600	-	0	4	4	3	3	16	2
0700	-	6	20	73	48	26	38	31
0800	-	32	85	251	160	104	80	73
0900	-	88	202	410	301	197	127	131
1000	-	85	266	321	331	299	174	118
1100	-	171	275	419	475	329	225	167
1200	180	194	351	552	563	381	222	215
1300	249	151	359	546	571	372	244	298
1400	277	197	390	503	540	341	256	328
1500	182	142	255	424	470	296	212	335
1600	137	78	157	311	365	238	165	186
1700	80	43	102	173	188	121	119	104
1800	22	22	40	51	57	50	37	31
1900	1	5	5	3	2	19	6	2
2000	-	-	-	-	-	-	-	-

	24/3	25/3	26/3	27/3	28/3	29/3	30/3	31/3
0600	0	7	2	2	3	2	5	6
0700	8	36	74	30	22	22	8	14
0800	54	104	214	86	50	74	31	57
0900	196	277	355	172	131	186	51	123
1000	133	427	483	226	184	347	72	190
1100	169	501	524	265	287	527	115	218
1200	275	490	563	309	306	625	81	258
1300	257	396	488	264	318	641	80	203
1400	154	273	523	198	294	620	77	179
1500	151	254	446	117	249	533	86	191
1600	69	229	334	66	104	342	78	135
1700	73	138	191	31	81	158	55	84
1800	28	61	68	6	15	47	29	68
1900	8	10	6	1	1	4	11	27
2000	-	-	-	-	-	-	-	6

TOTAL RADIATION
ICE ALGAE - BAFFIN 1984

TIME	1/4	2/4	3/4
0600	5	5	6
0700	17	29	12
0800	85	156	63
0900	222	294	233
1000	370	416	417
1100	536	535	528
1200	436	590	618
1300	387	574	-
1400	493	417	-
1500	349	339	-
1600	253	218	-
1700	210	177	-
1800	189	192	-
1900	52	63	-
2000	9	7	

Photosynthetically Active Radiation

(P.A.R.)

Totals are W m^{-2} for each hour ending at hour indicated. All times are A.S.T.

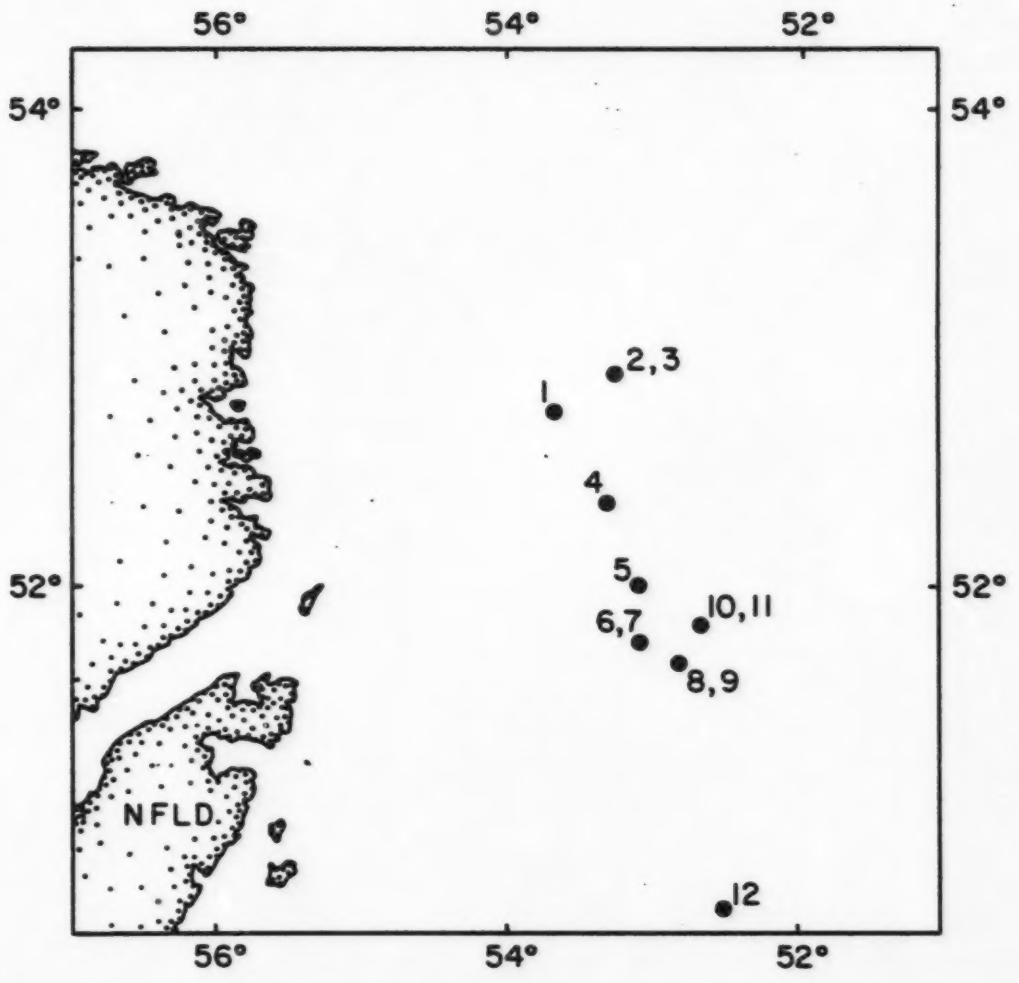
PAR
BAFFIN

Ice Algae Cruise

TIME	16/3	17/3	18/3	19/3	20/3	21/3	22/3	23/3	24/3
0600	-							1	
0700	-	6	13	28	24	20	23	28	9
0800	-	33	68	131	71	90	64	73	53
0900	-	89	170	242	164	177	114	135	175
1000	-	91	228	231	256	268	163	128	136
1100	-	175	241	328	386	299	217	178	178
1200	187	195	298	407	455	340	220	220	274
1300	242	156	304	411	459	341	242	292	256
1400	258	189	312	391	432	304	246	307	158
1500	173	137	212	314	373	260	197	291	152
1600	128	75	133	218	285	200	149	169	69
1700	71	32	84	127	144	95	100	94	65
1800	20	14	28	38	36	29	28	28	1
1900	-	-	-	1	1	1	2	1	1

TOTAL

TIME	25/3	26/3	27/3	28/3	29/3	30/3	31/3	1/4	2/4	3/4
0600	-	1	1	-	-	-	-	-	-	-
0700	27	34	27	16	17	2	6	9	11	6
0800	88	127	83	39	59	22	41	59	85	45
0900	207	233	169	108	147	41	95	162	192	168
1000	311	331	243	156	261	60	150	278	308	310
1100	376	405	294	236	402	97	175	410	406	403
1200	401	447	343	254	473	70	208	339	450	473
1300	341	393	296	265	478	70	167	302	437	-
1400	251	405	225	246	455	69	149	379	314	-
1500	226	332	135	207	378	76	158	267	251	-
1600	194	258	76	89	246	66	110	194	165	-
1700	111	145	34	66	119	44	68	148	127	-
1800	42	50	6	1?	37	21	52	126	128	-
1900	2	3	-	-	4	5	17	31	37	-



Locations of sampling stations occupied between 16 and 27 March 1983